sky130_osu_sc_18T_ms_tt_1P35_25C.ccs Library

Cell Groups
SKY130_OSU_SC_18T_MS__ADDFx
SKY130_OSU_SC_18T_MS__ADDHx
SKY130_OSU_SC_18T_MS__AND2x
SKY130_OSU_SC_18T_MS__AOI21
SKY130_OSU_SC_18T_MS__AOI22
SKY130_OSU_SC_18T_MS__BUFx
SKY130_OSU_SC_18T_MS__DFFRx
SKY130_OSU_SC_18T_MS__DFFSRx
SKY130_OSU_SC_18T_MS__DFFSx
SKY130_OSU_SC_18T_MS__DFFx
SKY130_OSU_SC_18T_MS__INVx
SKY130_OSU_SC_18T_MS__MUX2
SKY130_OSU_SC_18T_MS__NAND2x
SKY130_OSU_SC_18T_MS__NOR2x
SKY130_OSU_SC_18T_MS__OAI21
SKY130_OSU_SC_18T_MS__OAI22
SKY130_OSU_SC_18T_MS__OR2x
SKY130_OSU_SC_18T_MS__TBUFIx
SKY130_OSU_SC_18T_MS__TNBUFIx
SKY130_OSU_SC_18T_MS__XNOR2
SKY130_OSU_SC_18T_MS__XOR2
SKY130_OSU_SC_18T_MS_x

SKY130_OSU_SC_18T_MS__ADDFx

sky130_osu_sc_18T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

INPUT			OUTPUT		
A	**B**	**CI**	**CO**	**CON**	**S**
0	**0**	**0**	**0**	**1**	**0**
0	**0**	**1**	**0**	**1**	**1**
0	**1**	**0**	**0**	**1**	**1**
0	**1**	**1**	**1**	**0**	**0**
1	**0**	**0**	**0**	**1**	**1**
1	**0**	**1**	**1**	**0**	**0**
1	**1**	**0**	**1**	**0**	**0**
1	**1**	**1**	**1**	**0**	**1**

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__addf_1	46.88640
sky130_osu_sc_18T_ms__addf_l	46.88640

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)		
	A	**B**	**CI**	**CO**	**CON**	**S**
sky130_osu_sc_18T_ms__addf_1	0.01957	0.01965	0.01504	1.62677	0.71913	1.57144
sky130_osu_sc_18T_ms__addf_l	0.01956	0.01965	0.01504	1.11240	0.72891	1.13124

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__addf_1	0.00000	0.12220	0.16181
sky130_osu_sc_18T_ms__addf_l	0.00000	0.11165	0.15126

Delay Information

Delay(ns) to CO rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__addf_1	A->CO (RR)	0.24726	2.38679	28.85290
	B->CO (RR)	0.22091	2.27809	27.69610
	CI->CO (RR)	0.23527	2.39143	29.08910
	CON->CO (FR)	0.04320	0.95605	12.07520
sky130_osu_sc_18T_ms__addf_1	A->CO (RR)	0.24958	2.21728	23.49340
	B->CO (RR)	0.22393	2.12488	22.68710
	CI->CO (RR)	0.23745	2.22194	23.74500
	CON->CO (FR)	0.05033	1.04224	12.09570

Delay(ns) to CO falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__addf_1	A->CO (FF)	0.36483	3.18834	38.15160
	B->CO (FF)	0.33437	3.07482	36.89390
	CI->CO (FF)	0.32384	3.10697	37.71480
	CON->CO (RF)	0.03623	0.80600	10.14610
sky130_osu_sc_18T_ms__addf_1	A->CO (FF)	0.35734	2.82835	29.46860
	B->CO (FF)	0.32818	2.73382	28.58980
	CI->CO (FF)	0.31616	2.74673	29.05980
	CON->CO (RF)	0.03939	0.83385	9.72954

Delay(ns) to CON rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__addf_1	A->CON (FR)	0.24909	1.36363	12.30070
	B->CON (FR)	0.21923	1.29777	11.97860
	CI->CON (FR)	0.20795	1.28299	11.92770
sky130_osu_sc_18T_ms__addf_l	A->CON (FR)	0.23767	1.35797	12.38860
	B->CON (FR)	0.20854	1.29221	12.05840
	CI->CON (FR)	0.19636	1.27731	12.01200

Delay(ns) to CON falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__addf_1	A->CON (RF)	0.14472	0.90647	8.56828
	B->CON (RF)	0.13638	0.87656	8.45591
	CI->CON (RF)	0.13272	0.91341	8.86296
sky130_osu_sc_18T_ms__addf_l	A->CON (RF)	0.13942	0.90467	8.62037
	B->CON (RF)	0.13154	0.87480	8.50058
	CI->CON (RF)	0.12739	0.91162	8.91380

Delay(ns) to S rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__addf_1	A->S (-R)	0.51974	3.01634	29.82220
	B->S (-R)	0.52990	2.99771	29.37720
	CI->S (-R)	0.47525	2.92690	29.36730
	CON->S (RR)	0.13590	0.96016	8.66349
sky130_osu_sc_18T_ms__addf_l	A->S (-R)	0.49900	2.79069	25.21290
	B->S (-R)	0.50949	2.78245	24.95000
	CI->S (-R)	0.45421	2.70139	24.77590
	CON->S (RR)	0.13676	1.03289	8.75014

Delay(ns) to S falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__addf_1	A->S (-F)	0.42147	2.26594	21.54270
	B->S (-F)	0.41921	2.16259	20.70620
	CI->S (-F)	0.40779	2.26347	21.75350
	CON->S (FF)	0.16781	0.96428	7.83580
sky130_osu_sc_18T_ms__addf_l	A->S (-F)	0.40128	2.08397	18.19730
	B->S (-F)	0.39831	1.99630	17.60380
	CI->S (-F)	0.38736	2.08336	18.42860
	CON->S (FF)	0.16255	0.98980	7.64498

Power Information

Internal switching power(pJ) to CO rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.00287	0.00272	0.00300
	B	0.00355	0.00351	0.00387
	CI	0.00359	0.00368	0.00421
sky130_osu_sc_18T_ms__addf_l	A	0.00233	0.00211	0.00224
	B	0.00300	0.00290	0.00307
	CI	0.00305	0.00307	0.00337

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.00991	0.00991	0.01040
	B	0.00979	0.00997	0.01046
	CI	0.00859	0.00891	0.00943
sky130_osu_sc_18T_ms__addf_l	A	0.00937	0.00934	0.00958
	B	0.00925	0.00939	0.00964
	CI	0.00804	0.00833	0.00857

Internal switching power(pJ) to CON rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.00989	0.00990	0.00999
	B	0.00977	0.00991	0.01000
	CI	0.00857	0.00884	0.00896
sky130_osu_sc_18T_ms__addf_l	A	0.00936	0.00934	0.00943
	B	0.00924	0.00936	0.00944
	CI	0.00803	0.00828	0.00841

Internal switching power(pJ) to CON falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.00283	0.00267	0.00268
	B	0.00350	0.00344	0.00349
	CI	0.00358	0.00365	0.00379
sky130_osu_sc_18T_ms__addf_l	A	0.00229	0.00208	0.00212
	B	0.00296	0.00286	0.00290
	CI	0.00304	0.00306	0.00319

Internal switching power(pJ) to S rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.00990	0.00991	0.01036
	B	0.00979	0.00996	0.01036
	CI	0.00859	0.00891	0.00938
sky130_osu_sc_18T_ms__addf_l	A	0.00937	0.00934	0.00959
	B	0.00925	0.00939	0.00965
	CI	0.00804	0.00833	0.00859

Internal switching power(pJ) to S falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addf_1	A	0.02054	0.02072	0.02070
	B	0.01850	0.01817	0.01919
	CI	0.01668	0.01677	0.01675
sky130_osu_sc_18T_ms__addf_l	A	0.01980	0.01979	0.01985
	B	0.01778	0.01739	0.01840
	CI	0.01596	0.01595	0.01599

SKY130_OSU_SC_18T_MS__ADDHx

sky130_osu_sc_18T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

INPUT		OUTPUT		
A	B	CO	CON	S
0	0	0	1	0
0	1	0	0	1
1	0	0	0	1
1	1	1	1	0

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__addh_1	27.83880
sky130_osu_sc_18T_ms__addh_l	27.83880

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)		
	A	B	CO	CON	S
sky130_osu_sc_18T_ms__addh_1	0.00970	0.01054	1.59988	0.76899	1.61107
sky130_osu_sc_18T_ms__addh_l	0.00970	0.01054	0.97597	0.77004	1.00059

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__addh_1	0.00000	0.14013	0.16151
sky130_osu_sc_18T_ms__addh_l	0.00000	0.09506	0.12537

Delay Information

Delay(ns) to CO rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__addh_1	A->CO (RR)	0.16894	0.99238	8.64248
	B->CO (RR)	0.17505	0.99895	8.83714
sky130_osu_sc_18T_ms__addh_l	A->CO (RR)	0.16777	1.07699	8.49222
	B->CO (RR)	0.17374	1.08589	8.68654

Delay(ns) to CO falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__addh_1	A->CO (FF)	0.14326	0.91424	7.81068
	B->CO (FF)	0.15130	0.92789	7.86731
sky130_osu_sc_18T_ms__addh_l	A->CO (FF)	0.14153	0.95893	7.48374
	B->CO (FF)	0.14936	0.97289	7.54625

Delay(ns) to CON rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_18T_ms__addh_1	A->CON (RR)	B	0.22302	0.85162	5.15662
	A->CON (FR)	!B	0.14387	1.20807	11.95640
	B->CON (RR)	A	0.22906	0.85781	5.32852
	B->CON (FR)	!A	0.17516	1.28154	12.38490
sky130_osu_sc_18T_ms__addh_l	A->CON (RR)	B	0.20055	0.82045	5.02372
	A->CON (FR)	!B	0.12874	1.19280	11.95020
	B->CON (RR)	A	0.20658	0.82785	5.21202
	B->CON (FR)	!A	0.16002	1.26618	12.37900

Delay(ns) to CON falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_18T_ms__addh_1	A->CON (FF)	B	0.21639	1.01540	7.01473
	A->CON (RF)	!B	0.08830	0.86784	8.93100
	B->CON (FF)	A	0.21707	1.05025	7.34491
	B->CON (RF)	!A	0.10336	0.85958	8.68058
sky130_osu_sc_18T_ms__addh_l	A->CON (FF)	B	0.19638	0.97527	6.78361
	A->CON (RF)	!B	0.08142	0.85755	8.92956
	B->CON (FF)	A	0.19674	1.01103	7.12174
	B->CON (RF)	!A	0.09673	0.85024	8.67942

Delay(ns) to S rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_18T_ms__addh_1	A->S (RR)	!B	0.17756	2.26563	28.18670
	A->S (FR)	B	0.30573	2.38894	25.99410
	B->S (RR)	!A	0.19208	2.20482	27.10310
	B->S (FR)	A	0.30767	2.47877	27.14130
	CON->S (FR)	-	0.04714	0.97517	12.27090
sky130_osu_sc_18T_ms__addh_l	A->S (RR)	!B	0.17445	2.06839	22.03940
	A->S (FR)	B	0.28989	2.16729	19.76510
	B->S (RR)	!A	0.18960	2.02444	21.35290
	B->S (FR)	A	0.29134	2.23923	20.53370
	CON->S (FR)	-	0.05473	1.08688	12.30130

Delay(ns) to S falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_18T_ms__addh_1	A->S (FF)	!B	0.23911	2.86178	35.57300
	A->S (RF)	B	0.29333	1.92005	19.87690
	B->S (FF)	!A	0.27024	2.93942	36.06710
	B->S (RF)	A	0.29935	1.92639	20.06730
	CON->S (RF)	-	0.03416	0.78342	9.87873
sky130_osu_sc_18T_ms__addh_l	A->S (FF)	!B	0.22827	2.48877	26.29010
	A->S (RF)	B	0.27392	1.72935	14.88180
	B->S (FF)	!A	0.25904	2.56309	26.74630
	B->S (RF)	A	0.27986	1.73734	15.08430
	CON->S (RF)	-	0.03935	0.84961	9.77296

Power Information

Internal switching power(pJ) to CO rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addh_1	A	0.00000	0.00000	0.00000
	A	0.00435	0.00414	0.00384
	B	0.00000	0.00000	0.00000
	B	0.00398	0.00380	0.00344
sky130_osu_sc_18T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00358	0.00331	0.00334
	B	0.00000	0.00000	0.00000
	B	0.00321	0.00297	0.00283

Internal switching power(pJ) to CO falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__addh_1	A	0.00000	0.00000	0.00000
	A	0.00687	0.00662	0.00665
	B	0.00000	0.00000	0.00000
	B	0.00709	0.00709	0.00713
sky130_osu_sc_18T_ms__addh_l	A	0.00000	0.00000	0.00000
	A	0.00610	0.00581	0.00601
	B	0.00000	0.00000	0.00000
	B	0.00631	0.00626	0.00650

Internal switching power(pJ) to CON rising (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_18T_ms__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.00435	0.00414	0.00410
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00592	0.00592	0.00592
	B	A	0.00000	0.00000	0.00000
	B	A	0.00398	0.00380	0.00371
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00654	0.00654	0.00650
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00358	0.00330	0.00341
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00540	0.00537	0.00538
	B	A	0.00000	0.00000	0.00000
	B	A	0.00321	0.00297	0.00297
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00602	0.00599	0.00595

Internal switching power(pJ) to CON falling (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_18T_ms__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.00687	0.00663	0.00668
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00104	0.00102	0.00097
	B	A	0.00000	0.00000	0.00000
	B	A	0.00709	0.00708	0.00733
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00177	0.00169	0.00162
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00609	0.00581	0.00599
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00038	0.00035	0.00029
	B	A	0.00000	0.00000	0.00000
	B	A	0.00631	0.00625	0.00652
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00112	0.00101	0.00094

Internal switching power(pJ) to S rising (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_18T_ms__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.00689	0.00663	0.00677
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00105	0.00107	0.00103
	B	A	0.00000	0.00000	0.00000
	B	A	0.00710	0.00710	0.00731
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00179	0.00172	0.00168
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00610	0.00582	0.00602
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00039	0.00036	0.00033
	B	A	0.00000	0.00000	0.00000
	B	A	0.00632	0.00626	0.00653
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00113	0.00102	0.00098

Internal switching power(pJ) to S falling (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_18T_ms__addh_1	A	B	0.00000	0.00000	0.00000
	A	B	0.00435	0.00414	0.00395
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00592	0.00596	0.00597
	B	A	0.00000	0.00000	0.00000
	B	A	0.00399	0.00380	0.00355
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00654	0.00657	0.00654
sky130_osu_sc_18T_ms__addh_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00358	0.00331	0.00341
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00540	0.00540	0.00538
	B	A	0.00000	0.00000	0.00000
	B	A	0.00321	0.00297	0.00284
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00602	0.00600	0.00597

SKY130_OSU_SC_18T_MS__AND2x

sky130_osu_sc_18T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

INPUT		OUTPUT
A	B	Y
0	x	0
1	0	0
1	1	1

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__and2_1	12.45420
sky130_osu_sc_18T_ms__and2_2	15.38460
sky130_osu_sc_18T_ms__and2_4	21.24540
sky130_osu_sc_18T_ms__and2_6	27.10620
sky130_osu_sc_18T_ms__and2_8	32.96700
sky130_osu_sc_18T_ms__and2_l	12.45420

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_18T_ms__and2_1	0.00519	0.00528	1.60269
sky130_osu_sc_18T_ms__and2_2	0.00519	0.00528	3.19922
sky130_osu_sc_18T_ms__and2_4	0.00519	0.00528	6.07720
sky130_osu_sc_18T_ms__and2_6	0.00522	0.00528	8.98786
sky130_osu_sc_18T_ms__and2_8	0.00520	0.00529	11.61614
sky130_osu_sc_18T_ms__and2_l	0.00406	0.00416	1.12184

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__and2_1	0.00000	0.06728	0.10757
sky130_osu_sc_18T_ms__and2_2	0.00000	0.10757	0.10788
sky130_osu_sc_18T_ms__and2_4	0.00000	0.18817	0.21482
sky130_osu_sc_18T_ms__and2_6	0.00000	0.26877	0.32208
sky130_osu_sc_18T_ms__and2_8	0.00000	0.34936	0.42933
sky130_osu_sc_18T_ms__and2_l	0.00000	0.05418	0.08665

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__and2_1	A->Y (RR)	0.12771	0.90457	8.17848
	B->Y (RR)	0.13563	0.92017	8.38847
sky130_osu_sc_18T_ms__and2_2	A->Y (RR)	0.14991	0.85971	8.61090
	B->Y (RR)	0.15786	0.86496	8.80511
sky130_osu_sc_18T_ms__and2_4	A->Y (RR)	0.20939	0.89051	9.06091
	B->Y (RR)	0.21713	0.88579	9.21578
sky130_osu_sc_18T_ms__and2_6	A->Y (RR)	0.26714	0.94435	9.49989
	B->Y (RR)	0.27463	0.93770	9.62701
sky130_osu_sc_18T_ms__and2_8	A->Y (RR)	0.32388	1.00463	9.82669
	B->Y (RR)	0.33176	0.99709	9.93149
sky130_osu_sc_18T_ms__and2_l	A->Y (RR)	0.14311	1.00520	8.33363
	B->Y (RR)	0.15160	1.02036	8.55185

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__and2_1	A->Y (FF)	0.10867	0.82297	7.16279
	B->Y (FF)	0.11474	0.84006	7.26745
sky130_osu_sc_18T_ms__and2_2	A->Y (FF)	0.12742	0.79977	7.52816
	B->Y (FF)	0.13423	0.81385	7.63834
sky130_osu_sc_18T_ms__and2_4	A->Y (FF)	0.17964	0.83290	7.99280
	B->Y (FF)	0.18684	0.84611	8.07299
sky130_osu_sc_18T_ms__and2_6	A->Y (FF)	0.23453	0.88604	8.39400
	B->Y (FF)	0.24160	0.89734	8.44906
sky130_osu_sc_18T_ms__and2_8	A->Y (FF)	0.28610	0.93558	8.56900
	B->Y (FF)	0.29350	0.94610	8.62947
sky130_osu_sc_18T_ms__and2_l	A->Y (FF)	0.11949	0.88887	7.12951
	B->Y (FF)	0.12716	0.90827	7.24943

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__and2_1	A	0.00000	0.00000	0.00000
	A	0.00349	0.00310	0.00373
	B	0.00000	0.00000	0.00000
	B	0.00354	0.00308	0.00327
sky130_osu_sc_18T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.00672	0.00653	0.00706
	B	0.00000	0.00000	0.00000
	B	0.00679	0.00658	0.00693
sky130_osu_sc_18T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01376	0.01407	0.01476
	B	0.00000	0.00000	0.00000
	B	0.01380	0.01419	0.01434
sky130_osu_sc_18T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.02072	0.02150	0.02275
	B	0.00000	0.00000	0.00000
	B	0.02077	0.02166	0.02244
sky130_osu_sc_18T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.02777	0.02878	0.02979
	B	0.00000	0.00000	0.00000
	B	0.02785	0.02752	0.03639
sky130_osu_sc_18T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00258	0.00223	0.00269
	B	0.00000	0.00000	0.00000
	B	0.00265	0.00226	0.00246

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__and2_1	A	0.00000	0.00000	0.00000
	A	0.00828	0.00818	0.00935
	B	0.00000	0.00000	0.00000
	B	0.00930	0.00917	0.01022
sky130_osu_sc_18T_ms__and2_2	A	0.00000	0.00000	0.00000
	A	0.01042	0.01076	0.01191
	B	0.00000	0.00000	0.00000
	B	0.01146	0.01172	0.01278
sky130_osu_sc_18T_ms__and2_4	A	0.00000	0.00000	0.00000
	A	0.01567	0.01693	0.01827
	B	0.00000	0.00000	0.00000
	B	0.01673	0.01785	0.01902
sky130_osu_sc_18T_ms__and2_6	A	0.00000	0.00000	0.00000
	A	0.02101	0.02313	0.02477
	B	0.00000	0.00000	0.00000
	B	0.02204	0.02397	0.02537
sky130_osu_sc_18T_ms__and2_8	A	0.00000	0.00000	0.00000
	A	0.02615	0.02907	0.03117
	B	0.00000	0.00000	0.00000
	B	0.02719	0.02984	0.03156
sky130_osu_sc_18T_ms__and2_l	A	0.00000	0.00000	0.00000
	A	0.00646	0.00634	0.00707
	B	0.00000	0.00000	0.00000
	B	0.00722	0.00709	0.00774

Passive power(pJ) for A rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__and2_1	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00300	-0.00302	-0.00303
sky130_osu_sc_18T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00299	-0.00299	-0.00303
sky130_osu_sc_18T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00299	-0.00299	-0.00303
sky130_osu_sc_18T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00300	-0.00304	-0.00304
sky130_osu_sc_18T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00299	-0.00302	-0.00303
sky130_osu_sc_18T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	-0.00223	-0.00226	-0.00226

Passive power(pJ) for A falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__and2_1	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00302	0.00306	0.00304
sky130_osu_sc_18T_ms__and2_2	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00303	0.00306	0.00304
sky130_osu_sc_18T_ms__and2_4	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00303	0.00306	0.00304
sky130_osu_sc_18T_ms__and2_6	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00304	0.00308	0.00306
sky130_osu_sc_18T_ms__and2_8	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00303	0.00306	0.00304
sky130_osu_sc_18T_ms__and2_l	(!B * !Y)	0.00000	0.00000	0.00000
	(!B * !Y)	0.00226	0.00229	0.00227

Passive power(pJ) for B rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__and2_1	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00283	-0.00284	-0.00284
sky130_osu_sc_18T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00283	-0.00285	-0.00284
sky130_osu_sc_18T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00283	-0.00284	-0.00284
sky130_osu_sc_18T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00283	-0.00285	-0.00284
sky130_osu_sc_18T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00283	-0.00285	-0.00284
sky130_osu_sc_18T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	-0.00212	-0.00213	-0.00213

Passive power(pJ) for B falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__and2_1	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00285	0.00286	0.00285
sky130_osu_sc_18T_ms__and2_2	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00285	0.00287	0.00285
sky130_osu_sc_18T_ms__and2_4	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00285	0.00287	0.00285
sky130_osu_sc_18T_ms__and2_6	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00286	0.00287	0.00285
sky130_osu_sc_18T_ms__and2_8	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00286	0.00287	0.00285
sky130_osu_sc_18T_ms__and2_l	(!A * !Y)	0.00000	0.00000	0.00000
	(!A * !Y)	0.00213	0.00214	0.00213

SKY130_OSU_SC_18T_MS__AOI21

sky130_osu_sc_18T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

INPUT			OUTPUT
A0	A1	B0	Y
0	x	0	1
x	x	1	0
1	0	0	1
1	1	x	0

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__aoi21_l	12.45420

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_18T_ms__aoi21_l	0.00489	0.00511	0.00495	0.73299

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__aoi21_l	0.00000	0.02554	0.05363

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__aoi21_l	A0->Y (FR)	0.13551	1.26030	12.35970
	A1->Y (FR)	0.11728	1.20813	12.04090
	B0->Y (FR)	0.09926	1.18387	11.98240

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__aoi21_l	A0->Y (RF)	0.07880	0.81477	8.29303
	A1->Y (RF)	0.07143	0.81598	8.47433
	B0->Y (RF)	0.04550	0.74600	8.11622

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi21_l	A0	0.00000	0.00000	0.00000
	A0	0.00707	0.00699	0.00703
	A1	0.00000	0.00000	0.00000
	A1	0.00598	0.00592	0.00593
	B0	0.00564	0.00552	0.00558

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi21_l	A0	0.00000	0.00000	0.00000
	A0	0.00165	0.00143	0.00134
	A1	0.00000	0.00000	0.00000
	A1	0.00166	0.00141	0.00135
	B0	-0.00059	-0.00060	-0.00064

Passive power(pJ) for A0 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00242	-0.00263	-0.00262
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	-0.00267	-0.00268	-0.00268
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00267	-0.00269	-0.00268

Passive power(pJ) for A0 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00260	0.00264	0.00262
	(!A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !Y)	0.00267	0.00268	0.00268
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00268	0.00269	0.00268

Passive power(pJ) for A1 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00240	-0.00260	-0.00259
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	-0.00264	-0.00264	-0.00264
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00285	-0.00286	-0.00289

Passive power(pJ) for A1 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00257	0.00260	0.00259
	(!A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !Y)	0.00264	0.00264	0.00265
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00289	0.00292	0.00290

Passive power(pJ) for B0 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi21_l	(A0 * A1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !Y)	-0.00141	-0.00143	-0.00142

Passive power(pJ) for B0 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi21_l	(A0 * A1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !Y)	0.00160	0.00161	0.00147

SKY130_OSU_SC_18T_MS__AOI22

sky130_osu_sc_18T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

INPUT				OUTPUT
A0	A1	B0	B1	Y
0	x	0	x	1
0	x	1	0	1
x	x	1	1	0
1	0	0	x	1
1	0	1	0	1
1	1	x	x	0

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__aoi22_1	15.38460

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	A1	B0	B1	Y
sky130_osu_sc_18T_ms__aoi22_1	0.00490	0.00512	0.00529	0.00504	0.69783

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__aoi22_1	0.00000	0.02828	0.10725

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__aoi22_l	A0->Y (FR)	0.17195	1.29614	12.19370
	A1->Y (FR)	0.15426	1.26014	12.03410
	B0->Y (FR)	0.10488	1.16790	11.64580
	B1->Y (FR)	0.12276	1.20563	11.84180

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__aoi22_l	A0->Y (RF)	0.10112	0.82799	8.13216
	A1->Y (RF)	0.09378	0.82900	8.31411
	B0->Y (RF)	0.05553	0.78422	8.27512
	B1->Y (RF)	0.06291	0.78267	8.08835

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	A0	0.00867	0.00859	0.00860
	A1	0.00761	0.00751	0.00751
	B0	0.00605	0.00589	0.00598
	B1	0.00708	0.00694	0.00703

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	A0	0.00328	0.00307	0.00292
	A1	0.00329	0.00305	0.00294
	B0	-0.00032	-0.00035	-0.00038
	B1	-0.00028	-0.00032	-0.00037

Passive power(pJ) for A0 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	(A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * B1 * !Y)	-0.00245	-0.00260	-0.00262
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	-0.00267	-0.00268	-0.00267
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	-0.00267	-0.00267	-0.00267
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00267	-0.00269	-0.00267

Passive power(pJ) for A0 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	(A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * B1 * !Y)	0.00260	0.00260	0.00262
	(!A1 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * B1 * !Y)	0.00267	0.00268	0.00268
	(!A1 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * B0 * !B1 * Y)	0.00268	0.00269	0.00268
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00268	0.00269	0.00268

Passive power(pJ) for A1 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	(A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * B1 * !Y)	-0.00242	-0.00259	-0.00259
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	-0.00264	-0.00265	-0.00264
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	-0.00285	-0.00286	-0.00288
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00285	-0.00286	-0.00288

Passive power(pJ) for A1 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	(A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * B1 * !Y)	0.00257	0.00259	0.00259
	(!A0 * B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * B1 * !Y)	0.00264	0.00266	0.00265
	(!A0 * B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * B0 * !B1 * Y)	0.00288	0.00291	0.00289
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00288	0.00291	0.00289

Passive power(pJ) for B0 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	(A0 * A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B1 * !Y)	-0.00142	-0.00144	-0.00143
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	-0.00142	-0.00143	-0.00142
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	-0.00292	-0.00295	-0.00296
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	-0.00292	-0.00295	-0.00296

Passive power(pJ) for B0 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	(A0 * A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B1 * !Y)	0.00168	0.00169	0.00149
	(A0 * A1 * !B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B1 * !Y)	0.00142	0.00143	0.00142
	(!A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B1 * Y)	0.00296	0.00301	0.00297
	(!A0 * A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B1 * Y)	0.00296	0.00301	0.00297

Passive power(pJ) for B1 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	(A0 * A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B0 * !Y)	-0.00143	-0.00144	-0.00143
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	-0.00143	-0.00144	-0.00143
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00271	-0.00273	-0.00272
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	-0.00271	-0.00273	-0.00272

Passive power(pJ) for B1 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__aoi22_l	(A0 * A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * B0 * !Y)	0.00169	0.00169	0.00150
	(A0 * A1 * !B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * A1 * !B0 * !Y)	0.00143	0.00144	0.00143
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00273	0.00274	0.00273
	(!A0 * A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * A1 * !B0 * Y)	0.00273	0.00274	0.00273

SKY130_OSU_SC_18T_MS__BUFx

sky130_osu_sc_18T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

INPUT	OUTPUT
A	Y
0	0
1	1

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__buf_1	9.52380
sky130_osu_sc_18T_ms__buf_2	12.45420
sky130_osu_sc_18T_ms__buf_4	18.31500
sky130_osu_sc_18T_ms__buf_6	24.17580
sky130_osu_sc_18T_ms__buf_8	30.03660
sky130_osu_sc_18T_ms__buf_l	9.52380

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_18T_ms__buf_1	0.00529	1.60542
sky130_osu_sc_18T_ms__buf_2	0.00529	3.17485
sky130_osu_sc_18T_ms__buf_4	0.00529	6.11694
sky130_osu_sc_18T_ms__buf_6	0.00097	1.80000
sky130_osu_sc_18T_ms__buf_8	0.00530	11.84595
sky130_osu_sc_18T_ms__buf_l	0.00421	1.11935

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__buf_1	0.00000	0.05394	0.05394
sky130_osu_sc_18T_ms__buf_2	0.00000	0.08091	0.10757
sky130_osu_sc_18T_ms__buf_4	0.00000	0.13486	0.21482
sky130_osu_sc_18T_ms__buf_6	0.00000	0.00000	0.00000
sky130_osu_sc_18T_ms__buf_8	0.00000	0.24274	0.42933
sky130_osu_sc_18T_ms__buf_l	0.00000	0.04339	0.04339

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__buf_1	**A->Y (RR)**	0.09199	0.85866	8.12682
sky130_osu_sc_18T_ms__buf_2	**A->Y (RR)**	0.10329	0.79226	8.43465
sky130_osu_sc_18T_ms__buf_4	**A->Y (RR)**	0.14060	0.79910	8.90192
sky130_osu_sc_18T_ms__buf_8	**A->Y (RR)**	0.21261	0.86917	9.57165
sky130_osu_sc_18T_ms__buf_l	**A->Y (RR)**	0.10410	0.95261	8.21084

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__buf_1	**A->Y (FF)**	0.10364	0.81268	7.10656
sky130_osu_sc_18T_ms__buf_2	**A->Y (FF)**	0.12312	0.79164	7.47007
sky130_osu_sc_18T_ms__buf_4	**A->Y (FF)**	0.17583	0.82781	7.99093
sky130_osu_sc_18T_ms__buf_8	**A->Y (FF)**	0.28241	0.93315	8.64675
sky130_osu_sc_18T_ms__buf_l	**A->Y (FF)**	0.11574	0.87972	7.06473

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__buf_1	A	0.00000	0.00000	0.00000
	A	0.00325	0.00274	0.00338
sky130_osu_sc_18T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.00652	0.00620	0.00671
sky130_osu_sc_18T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01358	0.01380	0.01468
sky130_osu_sc_18T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.02751	0.02844	0.03006
sky130_osu_sc_18T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00249	0.00207	0.00248

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__buf_1	A	0.00000	0.00000	0.00000
	A	0.00805	0.00790	0.00906
sky130_osu_sc_18T_ms__buf_2	A	0.00000	0.00000	0.00000
	A	0.01017	0.01041	0.01152
sky130_osu_sc_18T_ms__buf_4	A	0.00000	0.00000	0.00000
	A	0.01546	0.01653	0.01779
sky130_osu_sc_18T_ms__buf_8	A	0.00000	0.00000	0.00000
	A	0.02595	0.02857	0.03046
sky130_osu_sc_18T_ms__buf_l	A	0.00000	0.00000	0.00000
	A	0.00634	0.00616	0.00691

Passive power(pJ) for A rising :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_18T_ms__buf_6	0.00000	0.00000	0.00000
	-0.00043	-0.00043	-0.00043

Passive power(pJ) for A falling :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_18T_ms__buf_6	0.00000	0.00000	0.00000
	0.00043	0.00043	0.00043

SKY130_OSU_SC_18T_MS__DFFRx

sky130_osu_sc_18T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

INPUT			OUTPUT	
D	RN	CK	Q	QN
0	1	R	0	1
1	1	R	1	0
x	0	x	0	1
x	1	x	IQ	IQN

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__dffr_1	63.73620
sky130_osu_sc_18T_ms__dffr_l	63.73620

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	RN	CK	Q	QN
sky130_osu_sc_18T_ms__dffr_1	0.00503	0.00503	0.01468	1.57409	1.57625
sky130_osu_sc_18T_ms__dffr_l	0.00503	0.00503	0.01465	1.13067	1.12756

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__dffr_1	0.00000	0.17331	0.25962
sky130_osu_sc_18T_ms__dffr_l	0.00000	0.16276	0.24907

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffr_1	CK->Q (RR)	0.52808	2.03212	18.04790
	QN->Q (FR)	0.04908	1.03881	13.00700
sky130_osu_sc_18T_ms__dffr_l	CK->Q (RR)	0.51884	2.16502	17.86830
	QN->Q (FR)	0.05416	1.10948	12.92530

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffr_1	CK->Q (RF)	0.50184	2.11490	19.81110
	QN->Q (RF)	0.04149	0.89902	11.25260
	RN->Q (FF)	0.35809	2.06249	20.55320
sky130_osu_sc_18T_ms__dffr_l	CK->Q (RF)	0.51077	2.30156	19.75850
	QN->Q (RF)	0.04318	0.91519	10.71750
	RN->Q (FF)	0.36764	2.24477	20.48850

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffr_1	CK->QN (RR)	0.43714	1.23841	8.71655
	RN->QN (FR)	0.29308	1.18358	9.46706
sky130_osu_sc_18T_ms__dffr_l	CK->QN (RR)	0.43830	1.31468	8.80411
	RN->QN (FR)	0.29485	1.25991	9.54109

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffr_1	**CK->QN (RF)**	0.44992	1.14189	6.88893
sky130_osu_sc_18T_ms__dffr_l	**CK->QN (RF)**	0.43277	1.15112	6.65250

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffr_1	hold	CK (R)	-0.10316	-0.14133	-0.77718
	setup	CK (R)	0.41610	0.43152	1.69506
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.10221	-0.14341	-0.77857
	setup	CK (R)	0.41646	0.42886	1.70477

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffr_1	hold	CK (R)	-0.19904	-0.58601	-5.06116
	setup	CK (R)	0.24631	0.60732	5.10696
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.19941	-0.58446	-5.06567
	setup	CK (R)	0.24627	0.60732	5.10696

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffr_1	hold	CK (R)	-0.10316	-0.14133	-0.77718
	setup	CK (R)	0.41610	0.43152	1.69506
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.10221	-0.14341	-0.77857
	setup	CK (R)	0.41646	0.42886	1.70477

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffr_1	hold	CK (R)	-0.19904	-0.58601	-5.06116
	setup	CK (R)	0.24631	0.60732	5.10696
sky130_osu_sc_18T_ms__dffr_l	hold	CK (R)	-0.19941	-0.58446	-5.06567
	setup	CK (R)	0.24627	0.60732	5.10696

Constraints(ns) for RN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffr_1	recovery	CK (R)	0.34710	0.36050	1.43495
	removal	CK (R)	-0.05438	-0.06127	-0.14048
sky130_osu_sc_18T_ms__dffr_l	recovery	CK (R)	0.34741	0.36183	1.44439
	removal	CK (R)	-0.05438	-0.06127	-0.14048

Constraints(ns) for RN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffr_1	recovery	CK (R)	0.34710	0.36050	1.43495
	removal	CK (R)	-0.05438	-0.06127	-0.14048
sky130_osu_sc_18T_ms__dffr_l	recovery	CK (R)	0.34741	0.36183	1.44439
	removal	CK (R)	-0.05438	-0.06127	-0.14048

Constraints(ns) for RN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffr_1	min_pulse_width	RN ()	0.21572	0.57861	13.33370
	min_pulse_width	RN ()	0.21572	0.57861	13.33370
sky130_osu_sc_18T_ms__dffr_l	min_pulse_width	RN ()	0.21140	0.57861	13.33370
	min_pulse_width	RN ()	0.21140	0.57861	13.33370

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffr_1	min_pulse_width	CK ()	0.23732	0.57861	13.33370
	min_pulse_width	CK ()	0.28484	0.57861	13.33370
sky130_osu_sc_18T_ms__dffr_l	min_pulse_width	CK ()	0.22220	0.57861	13.33370
	min_pulse_width	CK ()	0.27836	0.57861	13.33370

Constraints(ns) for CK falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffr_1	min_pulse_width	CK ()	0.52114	0.58941	13.33370
	min_pulse_width	CK ()	0.20492	0.57861	13.33370
sky130_osu_sc_18T_ms__dffr_l	min_pulse_width	CK ()	0.52143	0.58725	13.33370
	min_pulse_width	CK ()	0.20492	0.57861	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00831	0.00668	-0.00074
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00744	0.00615	-0.00162

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00914	0.00821	0.00074
	RN	-0.00112	-0.05417	-0.71719
	RN	0.02081	0.01994	0.01242
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00825	0.00754	0.00367
	RN	-0.00112	-0.04442	-0.51516
	RN	0.01991	0.01924	0.01543

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00914	0.00821	0.00069
	RN	-0.00112	-0.05422	-0.71817
	RN	0.02080	0.01993	0.01247
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00825	0.00755	0.00371
	RN	-0.00112	-0.04435	-0.51374
	RN	0.01990	0.01924	0.01544

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00827	0.00664	-0.00069
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00739	0.00612	-0.00147

Passive power(pJ) for D rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	-0.00227	-0.00258	-0.00262
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00969	0.00920	0.00907
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00440	0.00397	0.00397
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00227	-0.00258	-0.00262
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00968	0.00920	0.00907
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00440	0.00397	0.00397

Passive power(pJ) for D falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffr_1	CK	0.00000	0.00000	0.00000
	CK	0.00259	0.00262	0.00262
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01598	0.01573	0.01565
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00744	0.00727	0.00728
sky130_osu_sc_18T_ms__dffr_l	CK	0.00000	0.00000	0.00000
	CK	0.00259	0.00262	0.00262
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * Q * !QN) + (!CK * RN * !Q * QN)	0.01598	0.01573	0.01565
	(!CK * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !Q * QN)	0.00744	0.00727	0.00728

Passive power(pJ) for RN rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffr_1	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00328	0.00275	0.00327
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00878	0.00804	0.00838
sky130_osu_sc_18T_ms__dffr_l	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00328	0.00275	0.00327
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.00878	0.00804	0.00838

Passive power(pJ) for RN falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffr_1	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00735	0.00700	0.00811
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01559	0.01498	0.01578
sky130_osu_sc_18T_ms__dffr_l	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !Q * QN) + (!CK * !D * !Q * QN)	0.00735	0.00700	0.00811
	(!CK * D * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !Q * QN)	0.01559	0.01498	0.01578

Passive power(pJ) for CK rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00033	-0.00096	-0.00059
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00463	0.00363	0.00370
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00072	-0.00138	-0.00095
sky130_osu_sc_18T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00034	-0.00096	-0.00059
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.00463	0.00363	0.00370
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00072	-0.00138	-0.00095

Passive power(pJ) for CK falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01172	0.01142	0.01238
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02481	0.02386	0.02415
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01888	0.01836	0.01894
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02461	0.02389	0.02587
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01295	0.01264	0.01366
sky130_osu_sc_18T_ms__dffr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01171	0.01143	0.01238
	(D * RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * RN * !Q * QN)	0.02481	0.02390	0.02415
	(D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !Q * QN)	0.01888	0.01836	0.01894
	(!D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * Q * !QN)	0.02461	0.02389	0.02587
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01295	0.01264	0.01366

SKY130_OSU_SC_18T_MS__DFFSRx

sky130_osu_sc_18T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

INPUT				OUTPUT	
D	**RN**	**SN**	**CK**	**Q**	**QN**
0	**1**	**1**	**R**	**0**	**1**
1	**1**	**1**	**R**	**1**	**0**
x	**0**	**x**	**x**	**0**	**1**
x	**1**	**0**	**x**	**1**	**0**
x	**1**	**1**	**x**	**IQ**	**IQN**

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__dffsr_1	69.59700
sky130_osu_sc_18T_ms__dffsr_l	69.59700

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)	
	D	**RN**	**SN**	**CK**	**Q**	**QN**
sky130_osu_sc_18T_ms__dffsr_1	0.00499	0.00504	0.01082	0.01512	1.61424	1.62902
sky130_osu_sc_18T_ms__dffsr_l	0.00499	0.00504	0.01081	0.01512	1.12441	1.12994

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_18T_ms__dffsr_1	0.00000	0.18730	0.25992
sky130_osu_sc_18T_ms__dffsr_l	0.00000	0.17675	0.24937

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffsr_1	CK->Q (RR)	0.53062	2.00970	17.86310
	QN->Q (FR)	0.04690	1.01589	12.82490
	RN->Q (RR)	0.42263	1.91830	17.91430
	SN->Q (FR)	0.39432	1.98528	19.45240
sky130_osu_sc_18T_ms__dffsr_l	CK->Q (RR)	0.53618	2.18658	17.88640
	QN->Q (FR)	0.05410	1.10433	12.85560
	RN->Q (RR)	0.42874	2.09649	17.93610
	SN->Q (FR)	0.39992	2.16171	19.43870

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffsr_1	CK->Q (RF)	0.57097	2.16587	19.69040
	QN->Q (RF)	0.03810	0.85415	10.73580
	RN->Q (FF)	0.37033	2.05106	20.44680
sky130_osu_sc_18T_ms__dffsr_l	CK->Q (RF)	0.58586	2.37476	19.73790
	QN->Q (RF)	0.04309	0.91369	10.67710
	RN->Q (FF)	0.38664	2.26407	20.48140

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffsr_1	CK->QN (RR)	0.50689	1.31224	8.82857
	RN->QN (FR)	0.30811	1.19965	9.59421
sky130_osu_sc_18T_ms__dffsr_l	CK->QN (RR)	0.51153	1.39640	8.90094
	RN->QN (FR)	0.31344	1.28449	9.65750

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffsr_1	CK->QN (RF)	0.45834	1.14593	6.90623
	RN->QN (RF)	0.35068	1.05580	6.96490
	SN->QN (FF)	0.32255	1.12220	8.49435
sky130_osu_sc_18T_ms__dffsr_l	CK->QN (RF)	0.45261	1.17979	6.78652
	RN->QN (RF)	0.34531	1.09062	6.84271
	SN->QN (FF)	0.31687	1.15616	8.33655

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	hold	CK (R)	-0.11363	-0.15552	-0.86561
	setup	CK (R)	0.40194	0.40450	1.67149
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.11537	-0.15533	-0.86655
	setup	CK (R)	0.40382	0.40349	1.67027

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	hold	CK (R)	-0.23010	-0.61403	-5.28140
	setup	CK (R)	0.29385	0.63231	5.32758
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.22981	-0.61376	-5.28098
	setup	CK (R)	0.29299	0.63231	5.32707

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	hold	CK (R)	-0.11363	-0.15552	-0.86561
	setup	CK (R)	0.40194	0.40450	1.67149
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.11537	-0.15533	-0.86655
	setup	CK (R)	0.40382	0.40349	1.67027

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	hold	CK (R)	-0.23010	-0.61403	-5.28140
	setup	CK (R)	0.29385	0.63231	5.32758
sky130_osu_sc_18T_ms__dffsr_l	hold	CK (R)	-0.22981	-0.61376	-5.28098
	setup	CK (R)	0.29299	0.63231	5.32707

Constraints(ns) for RN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	recovery	CK (R)	0.30289	0.30912	1.34470
	removal	CK (R)	-0.03308	-0.03681	-0.10762
	hold	SN (R)	-0.31260	-0.62415	-4.30777
	setup	SN (R)	0.34471	0.67925	6.17680
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.30203	0.30833	1.34441
	removal	CK (R)	-0.03061	-0.03681	-0.10762
	hold	SN (R)	-0.30733	-0.61305	-4.22905
	setup	SN (R)	0.34401	0.67127	6.12814

Constraints(ns) for RN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	recovery	CK (R)	0.30289	0.30912	1.34470
	removal	CK (R)	-0.03308	-0.03681	-0.10762
	hold	SN (R)	-0.31574	-0.62415	-4.30777
	hold	SN (R)	-0.31260	-0.62516	-4.31794
	setup	SN (R)	0.34471	0.67812	6.09008
	setup	SN (R)	0.33588	0.67925	6.17680
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.30203	0.30833	1.34441
	removal	CK (R)	-0.03061	-0.03681	-0.10762
	hold	SN (R)	-0.31010	-0.61305	-4.22905
	hold	SN (R)	-0.30733	-0.61403	-4.24532
	setup	SN (R)	0.34401	0.66687	5.99088
	setup	SN (R)	0.32569	0.67127	6.12814

Constraints(ns) for RN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	min_pulse_width	RN ()	0.23948	0.57861	13.33370
	min_pulse_width	RN ()	0.24380	0.57861	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	RN ()	0.23948	0.57861	13.33370
	min_pulse_width	RN ()	0.23732	0.57861	13.33370

Constraints(ns) for SN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	recovery	CK (R)	0.06640	0.10767	1.89282
	removal	CK (R)	-0.01852	-0.07154	-0.65438
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.06685	0.10741	1.79101
	removal	CK (R)	-0.01852	-0.07154	-0.65733

Constraints(ns) for SN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	recovery	CK (R)	0.06640	0.10767	1.89282
	removal	CK (R)	-0.01852	-0.07154	-0.65438
sky130_osu_sc_18T_ms__dffsr_l	recovery	CK (R)	0.06685	0.10741	1.79101
	removal	CK (R)	-0.01852	-0.07154	-0.65733

Constraints(ns) for SN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	min_pulse_width	SN ()	0.31290	0.68224	13.33370
	min_pulse_width	SN ()	0.31127	0.68440	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	SN ()	0.31070	0.67144	13.33370
	min_pulse_width	SN ()	0.29900	0.67360	13.33370

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	min_pulse_width	CK ()	0.24164	0.57861	13.33370
	min_pulse_width	CK ()	0.30212	0.57861	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	CK ()	0.23300	0.57861	13.33370
	min_pulse_width	CK ()	0.29780	0.57861	13.33370

Constraints(ns) for CK falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	min_pulse_width	CK ()	0.50733	0.57861	13.33370
	min_pulse_width	CK ()	0.25892	0.57861	13.33370
sky130_osu_sc_18T_ms__dffsr_l	min_pulse_width	CK ()	0.50517	0.57861	13.33370
	min_pulse_width	CK ()	0.25676	0.57861	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.01015	0.00897	-0.00048
	RN	0.01847	0.01751	0.00688
	SN	-0.00112	-0.05500	-0.73549
	SN	0.02026	0.01935	0.00918
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00936	0.00811	0.00043
	RN	0.01767	0.01665	0.00850
	SN	-0.00112	-0.04427	-0.51231
	SN	0.01945	0.01850	0.01018

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.01060	0.00986	0.00362
	RN	-0.00112	-0.05500	-0.73549
	RN	0.02136	0.02054	0.01442
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00980	0.00917	0.00550
	RN	-0.00112	-0.04427	-0.51231
	RN	0.02054	0.01983	0.01616

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.01059	0.00986	0.00357
	RN	-0.00112	-0.05530	-0.74222
	RN	0.02135	0.02053	0.01427
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00979	0.00917	0.00546
	RN	-0.00112	-0.04440	-0.51482
	RN	0.02053	0.01983	0.01611

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.01010	0.00892	-0.00069
	RN	0.01843	0.01746	0.00727
	SN	-0.00112	-0.05530	-0.74220
	SN	0.02021	0.01931	0.00917
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00931	0.00807	0.00037
	RN	0.01762	0.01660	0.00832
	SN	-0.00112	-0.04440	-0.51481
	SN	0.01940	0.01846	0.01019

Passive power(pJ) for D rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	-0.00254	-0.00260	-0.00260
	(!CK * RN * SN * Q * !QN) + (!CK * RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * SN * Q * !QN) + (!CK * RN * SN * !Q * QN)	0.01223	0.01178	0.01170
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00487	0.00445	0.00443
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00485	0.00443	0.00442
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00490	0.00448	0.00446
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	-0.00254	-0.00260	-0.00260
	(!CK * RN * SN * Q * !QN) + (!CK * RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * SN * Q * !QN) + (!CK * RN * SN * !Q * QN)	0.01223	0.01178	0.01170
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00487	0.00445	0.00443
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00485	0.00443	0.00442
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00490	0.00448	0.00446

Passive power(pJ) for D falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	CK	0.00000	0.00000	0.00000
	CK	0.00260	0.00262	0.00260
	(!CK * RN * SN * Q * !QN) + (!CK * RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * SN * Q * !QN) + (!CK * RN * SN * !Q * QN)	0.01819	0.01794	0.01770
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00784	0.00770	0.00775
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00790	0.00774	0.00777
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00780	0.00767	0.00772
sky130_osu_sc_18T_ms__dffsr_l	CK	0.00000	0.00000	0.00000
	CK	0.00260	0.00262	0.00260
	(!CK * RN * SN * Q * !QN) + (!CK * RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * RN * SN * Q * !QN) + (!CK * RN * SN * !Q * QN)	0.01819	0.01793	0.01769
	(!CK * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * RN * !SN * Q * !QN)	0.00783	0.00769	0.00775
	(!CK * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * SN * !Q * QN)	0.00789	0.00774	0.00777
	(!CK * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * !RN * !SN * !Q * QN)	0.00780	0.00766	0.00771

Passive power(pJ) for RN rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00299	0.00245	0.00281
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01052	0.00975	0.00995
sky130_osu_sc_18T_ms__dffsr_l	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00299	0.00245	0.00282
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01052	0.00975	0.00995

Passive power(pJ) for RN falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00786	0.00758	0.00874
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01642	0.01579	0.01657
sky130_osu_sc_18T_ms__dffsr_l	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * SN * !Q * QN) + (!CK * !D * SN * !Q * QN)	0.00785	0.00758	0.00873
	(!CK * D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * SN * !Q * QN)	0.01641	0.01578	0.01656

Passive power(pJ) for SN rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	-0.00593	-0.00596	-0.00601
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00584	-0.00618	-0.00617
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00576	-0.00593	-0.00592
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00412	0.00365	0.00364
sky130_osu_sc_18T_ms__dffsr_l	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	-0.00593	-0.00596	-0.00601
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	-0.00583	-0.00617	-0.00616
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	-0.00576	-0.00592	-0.00592
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.00413	0.00365	0.00365

Passive power(pJ) for SN falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00601	0.00607	0.00603
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00613	0.00619	0.00617
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00590	0.00600	0.00594
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01247	0.01220	0.01221
sky130_osu_sc_18T_ms__dffsr_l	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(CK * RN * Q * !QN) + (!CK * D * RN * Q * !QN)	0.00601	0.00607	0.00603
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(CK * !RN * !Q * QN) + (!CK * !D * !RN * !Q * QN)	0.00612	0.00618	0.00616
	(!CK * D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * D * !RN * !Q * QN)	0.00590	0.00599	0.00593
	(!CK * !D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * RN * Q * !QN)	0.01245	0.01219	0.01220

Passive power(pJ) for CK rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffsr_1	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00034	-0.00094	-0.00059
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00521	0.00429	0.00439
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00513	0.00421	0.00431
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00058	-0.00122	-0.00081
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00389	0.00263	0.00362
sky130_osu_sc_18T_ms__dffsr_l	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	-0.00034	-0.00094	-0.00059
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.00521	0.00429	0.00438
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.00512	0.00420	0.00430
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	-0.00058	-0.00123	-0.00081
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.00389	0.00263	0.00362

Passive power(pJ) for CK falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last

sky130_osu_sc_18T_ms__dffsr_1	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.02749	0.02661	0.02681
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01175	0.01145	0.01241
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01916	0.01868	0.01929
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01920	0.01868	0.01927
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.02680	0.02599	0.02782
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01283	0.01252	0.01355
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01542	0.01482	0.01694
sky130_osu_sc_18T_ms__dffsr_l	**(D * RN * SN * !Q * QN)**	0.00000	0.00000	0.00000
	(D * RN * SN * !Q * QN)	0.02749	0.02661	0.02682
	(D * RN * Q * !QN)	0.00000	0.00000	0.00000
	(D * RN * Q * !QN)	0.01175	0.01145	0.01241
	(D * !RN * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * SN * !Q * QN)	0.01916	0.01868	0.01929
	(D * !RN * !SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * !RN * !SN * !Q * QN)	0.01920	0.01868	0.01927
	(!D * RN * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * Q * !QN)	0.02679	0.02599	0.02779
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * RN * SN * !Q * QN) + (!D * !RN * !Q * QN)	0.01283	0.01252	0.01355
	(!D * RN * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * RN * !SN * Q * !QN)	0.01541	0.01481	0.01693

SKY130_OSU_SC_18T_MS__DFFSx

sky130_osu_sc_18T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

INPUT			OUTPUT	
D	SN	CK	Q	QN
0	1	R	0	1
1	1	R	1	0
x	0	x	1	0
x	1	x	IQ	IQN

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__dffs_1	57.87540
sky130_osu_sc_18T_ms__dffs_l	57.87540

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)	
	D	SN	CK	Q	QN
sky130_osu_sc_18T_ms__dffs_1	0.00502	0.00873	0.01490	1.59022	1.58908
sky130_osu_sc_18T_ms__dffs_l	0.00502	0.00873	0.01490	1.13639	1.12640

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__dffs_1	0.00000	0.18046	0.28155
sky130_osu_sc_18T_ms__dffs_l	0.00000	0.16991	0.27099

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffs_1	CK->Q (RR)	0.37324	1.86256	17.99540
	QN->Q (FR)	0.04888	1.03641	13.00000
	SN->Q (FR)	0.28301	1.90489	19.29940
sky130_osu_sc_18T_ms__dffs_l	CK->Q (RR)	0.37488	2.00780	17.75520
	QN->Q (FR)	0.05398	1.10722	12.90250
	SN->Q (FR)	0.28347	2.04679	19.00650

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffs_1	CK->Q (RF)	0.56492	2.18872	19.98700
	QN->Q (RF)	0.04114	0.89653	11.27110
sky130_osu_sc_18T_ms__dffs_l	CK->Q (RF)	0.56978	2.36503	19.86040
	QN->Q (RF)	0.04291	0.91326	10.71480

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffs_1	CK->QN (RR)	0.49644	1.30761	8.80064
sky130_osu_sc_18T_ms__dffs_l	CK->QN (RR)	0.49420	1.37585	8.82928

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dffs_1	CK->QN (RF)	0.30456	0.97320	6.75979
	SN->QN (FF)	0.21313	1.01768	8.05812
sky130_osu_sc_18T_ms__dffs_l	CK->QN (RF)	0.29795	0.99485	6.49169
	SN->QN (FF)	0.20573	1.03401	7.74117

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffs_1	hold	CK (R)	-0.08119	-0.12126	-0.70847
	setup	CK (R)	0.26567	0.28467	1.62183
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.08288	-0.12033	-0.70843
	setup	CK (R)	0.26603	0.28455	1.62332

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffs_1	hold	CK (R)	-0.20927	-0.59112	-5.11468
	setup	CK (R)	0.28797	0.61391	5.16698
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.20672	-0.59087	-5.11311
	setup	CK (R)	0.28770	0.61391	5.16877

Constraints(ns) for D rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffs_1	hold	CK (R)	-0.08119	-0.12126	-0.70847
	setup	CK (R)	0.26567	0.28467	1.62183
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.08288	-0.12033	-0.70843
	setup	CK (R)	0.26603	0.28455	1.62332

Constraints(ns) for D falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffs_1	hold	CK (R)	-0.20927	-0.59112	-5.11468
	setup	CK (R)	0.28797	0.61391	5.16698
sky130_osu_sc_18T_ms__dffs_l	hold	CK (R)	-0.20672	-0.59087	-5.11311
	setup	CK (R)	0.28770	0.61391	5.16877

Constraints(ns) for SN rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffs_1	recovery	CK (R)	0.08084	0.11826	1.53263
	removal	CK (R)	-0.02382	-0.06673	-0.58993
sky130_osu_sc_18T_ms__dffs_l	recovery	CK (R)	0.08037	0.11826	1.42834
	removal	CK (R)	-0.02382	-0.06673	-0.58993

Constraints(ns) for SN rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffs_1	recovery	CK (R)	0.08084	0.11826	1.53263
	removal	CK (R)	-0.02382	-0.06673	-0.58993
sky130_osu_sc_18T_ms__dffs_l	recovery	CK (R)	0.08037	0.11826	1.42834
	removal	CK (R)	-0.02382	-0.06673	-0.58993

Constraints(ns) for SN falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffs_1	min_pulse_width	SN ()	0.19101	0.63043	13.33370
	min_pulse_width	SN ()	0.19337	0.63043	13.33370
sky130_osu_sc_18T_ms__dffs_l	min_pulse_width	SN ()	0.18688	0.61531	13.33370
	min_pulse_width	SN ()	0.18515	0.61747	13.33370

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffs_1	min_pulse_width	CK ()	0.15740	0.57861	13.33370
	min_pulse_width	CK ()	0.29996	0.57861	13.33370
sky130_osu_sc_18T_ms__dffs_l	min_pulse_width	CK ()	0.15308	0.57861	13.33370
	min_pulse_width	CK ()	0.29348	0.57861	13.33370

Constraints(ns) for CK falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dffs_1	min_pulse_width	CK ()	0.36693	0.57861	13.33370
	min_pulse_width	CK ()	0.25244	0.57861	13.33370
sky130_osu_sc_18T_ms__dffs_l	min_pulse_width	CK ()	0.36693	0.57861	13.33370
	min_pulse_width	CK ()	0.25028	0.57861	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00833	0.00664	-0.00108
	SN	-0.00112	-0.05450	-0.72454
	SN	0.01751	0.01594	0.00159
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00744	0.00611	-0.00135
	SN	-0.00112	-0.04455	-0.51777
	SN	0.01661	0.01541	0.00766

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00909	0.00825	0.00108
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00820	0.00755	0.00394

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00908	0.00825	0.00107
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00820	0.00755	0.00395

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00828	0.00661	-0.00107
	SN	-0.00112	-0.05448	-0.72399
	SN	0.01746	0.01589	0.00156
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00740	0.00608	-0.00129
	SN	-0.00112	-0.04432	-0.51319
	SN	0.01657	0.01537	0.00767

Passive power(pJ) for D rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	-0.00257	-0.00263	-0.00263
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00939	0.00889	0.00867
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00429	0.00385	0.00383
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	-0.00257	-0.00263	-0.00263
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00939	0.00889	0.00867
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00429	0.00385	0.00383

Passive power(pJ) for D falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffs_1	CK	0.00000	0.00000	0.00000
	CK	0.00263	0.00265	0.00263
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01549	0.01522	0.01515
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00752	0.00734	0.00742
sky130_osu_sc_18T_ms__dffs_l	CK	0.00000	0.00000	0.00000
	CK	0.00263	0.00265	0.00263
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * SN * Q * !QN) + (!CK * SN * !Q * QN)	0.01549	0.01522	0.01515
	(!CK * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !SN * Q * !QN)	0.00752	0.00734	0.00742

Passive power(pJ) for SN rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffs_1	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	-0.00448	-0.00452	-0.00452
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00327	0.00283	0.00309
sky130_osu_sc_18T_ms__dffs_l	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	-0.00448	-0.00452	-0.00452
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00327	0.00283	0.00309

Passive power(pJ) for SN falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffs_1	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00451	0.00454	0.00453
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00887	0.00850	0.00898
sky130_osu_sc_18T_ms__dffs_l	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00000	0.00000	0.00000
	(CK * Q * !QN) + (!CK * D * Q * !QN)	0.00451	0.00454	0.00453
	(!CK * !D * Q * !QN)	0.00000	0.00000	0.00000
	(!CK * !D * Q * !QN)	0.00887	0.00850	0.00898

Passive power(pJ) for CK rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffs_1	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00035	-0.00102	-0.00060
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00065	-0.00132	-0.00088
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00328	0.00202	0.00306
sky130_osu_sc_18T_ms__dffs_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00035	-0.00102	-0.00060
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	-0.00065	-0.00132	-0.00088
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.00328	0.00202	0.00306

Passive power(pJ) for CK falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dffs_1	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.02453	0.02363	0.02384
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01172	0.01143	0.01239
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02407	0.02326	0.02525
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01288	0.01257	0.01359
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01505	0.01451	0.01664
sky130_osu_sc_18T_ms__dffs_l	(D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(D * SN * !Q * QN)	0.02453	0.02363	0.02384
	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01172	0.01143	0.01239
	(!D * SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * SN * Q * !QN)	0.02407	0.02326	0.02525
	(!D * SN * !Q * QN)	0.00000	0.00000	0.00000
	(!D * SN * !Q * QN)	0.01288	0.01256	0.01359
	(!D * !SN * Q * !QN)	0.00000	0.00000	0.00000
	(!D * !SN * Q * !QN)	0.01505	0.01451	0.01664

SKY130_OSU_SC_18T_MS__DFFx

sky130_osu_sc_18T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

INPUT		OUTPUT	
D	CK	Q	QN
0	R	0	1
1	R	1	0
x	x	IQ	IQN

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__dff_1	48.35160
sky130_osu_sc_18T_ms__dff_l	48.35160

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)	
	D	CK	Q	QN
sky130_osu_sc_18T_ms__dff_1	0.00517	0.01460	1.63643	1.63340
sky130_osu_sc_18T_ms__dff_l	0.00517	0.01460	1.10505	1.11634

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__dff_1	0.00000	0.17104	0.21576
sky130_osu_sc_18T_ms__dff_l	0.00000	0.16048	0.20520

Delay Information

Delay(ns) to Q rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dff_1	CK->Q (RR)	0.33079	1.79095	17.75710
	QN->Q (FR)	0.04657	1.01605	12.87810
sky130_osu_sc_18T_ms__dff_l	CK->Q (RR)	0.34349	1.96192	17.38260
	QN->Q (FR)	0.05485	1.11035	12.86320

Delay(ns) to Q falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dff_1	CK->Q (RF)	0.47274	2.06542	19.76690
	QN->Q (RF)	0.03791	0.85526	10.79140
sky130_osu_sc_18T_ms__dff_l	CK->Q (RF)	0.49152	2.26886	19.42890
	QN->Q (RF)	0.04299	0.90570	10.56450

Delay(ns) to QN rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dff_1	CK->QN (RR)	0.41195	1.20617	8.70566
sky130_osu_sc_18T_ms__dff_l	CK->QN (RR)	0.41943	1.29672	8.77280

Delay(ns) to QN falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__dff_1	CK->QN (RF)	0.26730	0.92224	6.62687
sky130_osu_sc_18T_ms__dff_l	CK->QN (RF)	0.26785	0.96334	6.44509

Constraint Information

Constraints(ns) for D rising :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dff_1	hold	CK (R)	-0.08046	-0.12147	-0.73439
	setup	CK (R)	0.22371	0.24399	1.63498
sky130_osu_sc_18T_ms__dff_l	hold	CK (R)	-0.07988	-0.12261	-0.73446
	setup	CK (R)	0.22298	0.24147	1.63410

Constraints(ns) for D falling :

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dff_1	hold	CK (R)	-0.19274	-0.59053	-5.12972
	setup	CK (R)	0.23498	0.61371	5.19431
sky130_osu_sc_18T_ms__dff_l	hold	CK (R)	-0.19222	-0.58936	-5.12790
	setup	CK (R)	0.23682	0.61169	5.19292

Constraints(ns) for CK rising (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dff_1	min_pulse_width	CK ()	0.14660	0.57861	13.33370
	min_pulse_width	CK ()	0.27404	0.57861	13.33370
sky130_osu_sc_18T_ms__dff_l	min_pulse_width	CK ()	0.14228	0.57861	13.33370
	min_pulse_width	CK ()	0.26756	0.57861	13.33370

Constraints(ns) for CK falling (conditional):

Cell Name	Timing Check	Ref Pin(trans)	Reference Slew Rate(ns)		
			first	mid	last
sky130_osu_sc_18T_ms__dff_1	**min_pulse_width**	**CK ()**	0.32372	0.57861	13.33370
	min_pulse_width	**CK ()**	0.18980	0.57861	13.33370
sky130_osu_sc_18T_ms__dff_l	**min_pulse_width**	**CK ()**	0.32372	0.57861	13.33370
	min_pulse_width	**CK ()**	0.18980	0.57861	13.33370

Power Information

Internal switching power(pJ) to Q rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00874	0.00740	-0.00181
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00793	0.00658	-0.00082

Internal switching power(pJ) to Q falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00927	0.00852	0.00239
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00848	0.00780	0.00379

Internal switching power(pJ) to QN rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00927	0.00852	0.00239
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00848	0.00779	0.00377

Internal switching power(pJ) to QN falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00869	0.00738	-0.00201
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00789	0.00653	-0.00077

Passive power(pJ) for D rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	-0.00227	-0.00257	-0.00261
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00889	0.00841	0.00824
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	-0.00227	-0.00257	-0.00261
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00889	0.00842	0.00825

Passive power(pJ) for D falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dff_1	CK	0.00000	0.00000	0.00000
	CK	0.00259	0.00261	0.00261
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01601	0.01571	0.01564
sky130_osu_sc_18T_ms__dff_l	CK	0.00000	0.00000	0.00000
	CK	0.00259	0.00261	0.00261
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.00000	0.00000	0.00000
	(!CK * Q * !QN) + (!CK * !Q * QN)	0.01601	0.01572	0.01564

Passive power(pJ) for CK rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dff_1	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00035	-0.00102	-0.00060
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00064	-0.00131	-0.00087
sky130_osu_sc_18T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	-0.00035	-0.00102	-0.00060
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	-0.00064	-0.00131	-0.00087

Passive power(pJ) for CK falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__dff_1	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01168	0.01141	0.01234
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.02406	0.02313	0.02344
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.02445	0.02360	0.02560
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01283	0.01251	0.01353
sky130_osu_sc_18T_ms__dff_l	(D * Q * !QN)	0.00000	0.00000	0.00000
	(D * Q * !QN)	0.01168	0.01141	0.01234
	(D * !Q * QN)	0.00000	0.00000	0.00000
	(D * !Q * QN)	0.02406	0.02314	0.02345
	(!D * Q * !QN)	0.00000	0.00000	0.00000
	(!D * Q * !QN)	0.02445	0.02360	0.02560
	(!D * !Q * QN)	0.00000	0.00000	0.00000
	(!D * !Q * QN)	0.01283	0.01250	0.01353

SKY130_OSU_SC_18T_MS__INVx

sky130_osu_sc_18T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

INPUT	OUTPUT
A	Y
0	1
1	0

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__inv_1	6.59340
sky130_osu_sc_18T_ms__inv_10	32.96700
sky130_osu_sc_18T_ms__inv_2	9.52380
sky130_osu_sc_18T_ms__inv_3	12.45420
sky130_osu_sc_18T_ms__inv_4	15.38460
sky130_osu_sc_18T_ms__inv_6	21.24540
sky130_osu_sc_18T_ms__inv_8	27.10620
sky130_osu_sc_18T_ms__inv_l	6.59340

Pin Capacitance Information

Cell Name	Pin Cap(pf)	Max Cap(pf)
	A	Y
sky130_osu_sc_18T_ms__inv_1	0.00507	1.57452
sky130_osu_sc_18T_ms__inv_10	0.04770	14.22599
sky130_osu_sc_18T_ms__inv_2	0.00973	3.13413
sky130_osu_sc_18T_ms__inv_3	0.01451	4.50036
sky130_osu_sc_18T_ms__inv_4	0.01919	6.10897
sky130_osu_sc_18T_ms__inv_6	0.02878	8.98989
sky130_osu_sc_18T_ms__inv_8	0.03825	11.90897
sky130_osu_sc_18T_ms__inv_l	0.00396	1.09336

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__inv_1	0.00000	0.02697	0.05363
sky130_osu_sc_18T_ms__inv_10	0.00000	0.26971	0.53626
sky130_osu_sc_18T_ms__inv_2	0.00000	0.05394	0.10725
sky130_osu_sc_18T_ms__inv_3	0.00000	0.08091	0.16088
sky130_osu_sc_18T_ms__inv_4	0.00000	0.10788	0.21451
sky130_osu_sc_18T_ms__inv_6	0.00000	0.16182	0.32176
sky130_osu_sc_18T_ms__inv_8	0.00000	0.21577	0.42901
sky130_osu_sc_18T_ms__inv_l	0.00000	0.02170	0.04326

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__inv_1	**A->Y (FR)**	0.04444	0.95127	11.92100
sky130_osu_sc_18T_ms__inv_10	**A->Y (FR)**	0.06392	0.68207	11.91350
sky130_osu_sc_18T_ms__inv_2	**A->Y (FR)**	0.03611	0.82799	11.95690
sky130_osu_sc_18T_ms__inv_3	**A->Y (FR)**	0.03963	0.78269	11.94100
sky130_osu_sc_18T_ms__inv_4	**A->Y (FR)**	0.04068	0.74842	12.00110
sky130_osu_sc_18T_ms__inv_6	**A->Y (FR)**	0.04607	0.71279	11.99550
sky130_osu_sc_18T_ms__inv_8	**A->Y (FR)**	0.05435	0.69405	12.04360
sky130_osu_sc_18T_ms__inv_l	**A->Y (FR)**	0.05154	1.03908	12.04790

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__inv_1	**A->Y (RF)**	0.03422	0.77689	9.73137
sky130_osu_sc_18T_ms__inv_10	**A->Y (RF)**	0.05277	0.56213	9.57432
sky130_osu_sc_18T_ms__inv_2	**A->Y (RF)**	0.02860	0.69072	9.73911
sky130_osu_sc_18T_ms__inv_3	**A->Y (RF)**	0.03109	0.65602	9.74737
sky130_osu_sc_18T_ms__inv_4	**A->Y (RF)**	0.03127	0.62880	9.78773
sky130_osu_sc_18T_ms__inv_6	**A->Y (RF)**	0.03824	0.59687	9.76756
sky130_osu_sc_18T_ms__inv_8	**A->Y (RF)**	0.04536	0.57933	9.77565
sky130_osu_sc_18T_ms__inv_l	**A->Y (RF)**	0.03857	0.82669	9.63341

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__inv_1	A	0.00000	0.00000	0.00000
	A	0.00417	0.00415	0.00440
sky130_osu_sc_18T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	0.03601	0.03669	0.03912
sky130_osu_sc_18T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	0.00749	0.00692	0.00809
sky130_osu_sc_18T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	0.01145	0.01155	0.01235
sky130_osu_sc_18T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	0.01477	0.01449	0.01603
sky130_osu_sc_18T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	0.02190	0.02222	0.02394
sky130_osu_sc_18T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	0.02899	0.02959	0.03172
sky130_osu_sc_18T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	0.00325	0.00300	0.00336

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__inv_1	A	0.00000	0.00000	0.00000
	A	-0.00074	-0.00077	-0.00074
sky130_osu_sc_18T_ms__inv_10	A	0.00000	0.00000	0.00000
	A	-0.01429	-0.01344	-0.01140
sky130_osu_sc_18T_ms__inv_2	A	0.00000	0.00000	0.00000
	A	-0.00256	-0.00251	-0.00236
sky130_osu_sc_18T_ms__inv_3	A	0.00000	0.00000	0.00000
	A	-0.00338	-0.00334	-0.00301
sky130_osu_sc_18T_ms__inv_4	A	0.00000	0.00000	0.00000
	A	-0.00533	-0.00515	-0.00462
sky130_osu_sc_18T_ms__inv_6	A	0.00000	0.00000	0.00000
	A	-0.00809	-0.00791	-0.00692
sky130_osu_sc_18T_ms__inv_8	A	0.00000	0.00000	0.00000
	A	-0.01113	-0.01063	-0.00917
sky130_osu_sc_18T_ms__inv_l	A	0.00000	0.00000	0.00000
	A	-0.00055	-0.00058	-0.00057

SKY130_OSU_SC_18T_MS__MUX2

sky130_osu_sc_18T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

INPUT			OUTPUT
A0	**A1**	**S0**	**Y**
0	**0**	**x**	**0**
0	**1**	**0**	**0**
x	**1**	**1**	**1**
1	**x**	**0**	**1**
1	**0**	**1**	**0**

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__mux2_1	18.31500

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	**A1**	**S0**	**Y**
sky130_osu_sc_18T_ms__mux2_1	0.12153	0.12134	0.01032	0.11373

Leakage Information

Cell Name	Leakage(nW)		
	Min.	**Avg**	**Max.**
sky130_osu_sc_18T_ms__mux2_1	0.00000	0.05402	0.05402

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_18T_ms__mux2_1	A0->Y (RR)	-	0.02942	0.44786	4.06623
	A1->Y (RR)	-	0.03123	0.44863	4.06758
	S0->Y (RR)	(!A0 * A1)	0.08063	0.44006	1.85144
	S0->Y (FR)	(A0 * !A1)	0.06099	0.53571	3.75656

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_18T_ms__mux2_1	A0->Y (FF)	-	0.02597	0.39590	3.44926
	A1->Y (FF)	-	0.02437	0.39240	3.44327
	S0->Y (FF)	(!A0 * A1)	0.10475	0.51614	2.60692
	S0->Y (RF)	(A0 * !A1)	0.03955	0.43462	2.91329

Power Information

Internal switching power(pJ) to Y rising (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_18T_ms__mux2_1	A0	-	0.00000	0.00000	0.00000
	A0	-	-0.00443	-0.00445	-0.00444
	A1	-	0.00000	0.00000	0.00000
	A1	-	-0.00313	-0.00314	-0.00314
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00498	0.00473	0.00603
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	-0.00283	-0.00338	-0.00272

Internal switching power(pJ) to Y falling (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_18T_ms__mux2_1	A0	-	0.00000	0.00000	0.00000
	A0	-	0.00443	0.00445	0.00445
	A1	-	0.00000	0.00000	0.00000
	A1	-	0.00314	0.00314	0.00315
	S0	(A0 * !A1)	0.00000	0.00000	0.00000
	S0	(A0 * !A1)	0.00104	0.00054	0.00123
	S0	(!A0 * A1)	0.00000	0.00000	0.00000
	S0	(!A0 * A1)	0.01112	0.01084	0.01201

Passive power(pJ) for A0 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__mux2_1	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00000	0.00000	0.00000
	(A1 * S0 * Y) + (!A1 * S0 * !Y)	-0.00119	-0.00119	-0.00119

Passive power(pJ) for A0 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__mux2_1	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00000	0.00000	0.00000
	(A1 * S0 * Y) + (!A1 * S0 * !Y)	0.00119	0.00119	0.00119

Passive power(pJ) for A1 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__mux2_1	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	-0.00140	-0.00140	-0.00140

Passive power(pJ) for A1 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__mux2_1	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !S0 * Y) + (!A0 * !S0 * !Y)	0.00140	0.00140	0.00140

Passive power(pJ) for S0 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__mux2_1	(A0 * A1 * Y)	0.00000	0.00000	0.00000
	(A0 * A1 * Y)	-0.00092	-0.00143	-0.00075
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	-0.00088	-0.00143	-0.00075

Passive power(pJ) for S0 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__mux2_1	(A0 * A1 * Y)	0.00000	0.00000	0.00000
	(A0 * A1 * Y)	0.00837	0.00809	0.00930
	(!A0 * !A1 * !Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !Y)	0.00773	0.00746	0.00877

SKY130_OSU_SC_18T_MS__NAND2x

sky130_osu_sc_18T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

INPUT		OUTPUT
A	B	Y
0	x	1
1	0	1
1	1	0

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__nand2_1	9.52380
sky130_osu_sc_18T_ms__nand2_l	9.52380

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_18T_ms__nand2_1	0.00509	0.00505	1.43192
sky130_osu_sc_18T_ms__nand2_l	0.00397	0.00394	1.00050

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__nand2_1	0.00000	0.02698	0.10725
sky130_osu_sc_18T_ms__nand2_l	0.00000	0.02171	0.08652

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__nand2_1	A->Y (FR)	0.04592	0.93078	11.40030
	B->Y (FR)	0.05328	0.93108	11.30900
sky130_osu_sc_18T_ms__nand2_l	A->Y (FR)	0.05274	1.01753	11.53020
	B->Y (FR)	0.06154	1.02231	11.49580

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__nand2_1	A->Y (RF)	0.05259	0.98354	12.04380
	B->Y (RF)	0.05994	0.98288	11.90670
sky130_osu_sc_18T_ms__nand2_l	A->Y (RF)	0.06011	1.07081	11.99600
	B->Y (RF)	0.06718	1.07121	11.86070

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	0.00442	0.00441	0.00457
	B	0.00000	0.00000	0.00000
	B	0.00550	0.00543	0.00556
sky130_osu_sc_18T_ms__nand2_l	A	0.00000	0.00000	0.00000
	A	0.00342	0.00339	0.00349
	B	0.00000	0.00000	0.00000
	B	0.00421	0.00415	0.00425

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__nand2_1	A	0.00000	0.00000	0.00000
	A	-0.00043	-0.00051	-0.00048
	B	0.00000	0.00000	0.00000
	B	-0.00039	-0.00047	-0.00046
sky130_osu_sc_18T_ms__nand2_l	A	0.00000	0.00000	0.00000
	A	-0.00036	-0.00041	-0.00040
	B	0.00000	0.00000	0.00000
	B	-0.00033	-0.00039	-0.00039

Passive power(pJ) for A rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__nand2_1	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00295	-0.00297	-0.00298
sky130_osu_sc_18T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	-0.00217	-0.00220	-0.00220

Passive power(pJ) for A falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__nand2_1	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00297	0.00300	0.00299
sky130_osu_sc_18T_ms__nand2_l	(!B * Y)	0.00000	0.00000	0.00000
	(!B * Y)	0.00220	0.00222	0.00221

Passive power(pJ) for B rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__nand2_1	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00274	-0.00276	-0.00274
sky130_osu_sc_18T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00203	-0.00204	-0.00203

Passive power(pJ) for B falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__nand2_1	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00276	0.00277	0.00275
sky130_osu_sc_18T_ms__nand2_l	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00204	0.00205	0.00204

SKY130_OSU_SC_18T_MS__NOR2x

sky130_osu_sc_18T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

INPUT		OUTPUT
A	B	Y
0	0	1
x	1	0
1	x	0

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__nor2_1	9.52380
sky130_osu_sc_18T_ms__nor2_l	9.52380

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_18T_ms__nor2_1	0.00509	0.00539	0.76157
sky130_osu_sc_18T_ms__nor2_l	0.00389	0.00423	0.52479

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__nor2_1	0.00000	0.01921	0.05363
sky130_osu_sc_18T_ms__nor2_l	0.00000	0.01643	0.04326

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__nor2_1	A->Y (FR)	0.10293	1.20299	12.23890
	B->Y (FR)	0.08045	1.13845	11.81100
sky130_osu_sc_18T_ms__nor2_l	A->Y (FR)	0.11703	1.31435	12.13830
	B->Y (FR)	0.09734	1.26321	11.87780

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__nor2_1	A->Y (RF)	0.04417	0.66378	7.19662
	B->Y (RF)	0.03612	0.65169	7.17563
sky130_osu_sc_18T_ms__nor2_l	A->Y (RF)	0.04802	0.69372	7.10740
	B->Y (RF)	0.04051	0.68315	7.08923

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00579	0.00574	0.00577
	B	0.00000	0.00000	0.00000
	B	0.00456	0.00448	0.00458
sky130_osu_sc_18T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00429	0.00425	0.00426
	B	0.00000	0.00000	0.00000
	B	0.00351	0.00341	0.00346

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00073	0.00051	0.00049
	B	0.00000	0.00000	0.00000
	B	-0.00060	-0.00064	-0.00067
sky130_osu_sc_18T_ms__nor2_1	A	0.00000	0.00000	0.00000
	A	0.00047	0.00033	0.00030
	B	0.00000	0.00000	0.00000
	B	-0.00041	-0.00044	-0.00048

Passive power(pJ) for A rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__nor2_1	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00228	-0.00261	-0.00262
sky130_osu_sc_18T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	-0.00166	-0.00188	-0.00189

Passive power(pJ) for A falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__nor2_1	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00261	0.00263	0.00262
sky130_osu_sc_18T_ms__nor2_l	(B * !Y)	0.00000	0.00000	0.00000
	(B * !Y)	0.00188	0.00189	0.00189

Passive power(pJ) for B rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__nor2_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00142	-0.00143	-0.00142
sky130_osu_sc_18T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00105	-0.00106	-0.00105

Passive power(pJ) for B falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__nor2_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00152	0.00153	0.00146
sky130_osu_sc_18T_ms__nor2_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00112	0.00113	0.00108

SKY130_OSU_SC_18T_MS__OAI21

sky130_osu_sc_18T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

INPUT			OUTPUT
A0	A1	B0	Y
0	0	x	1
x	1	0	1
x	1	1	0
1	x	0	1
1	x	1	0

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__oai21_l	12.45420

Pin Capacitance Information

Cell Name	Pin Cap(pf)			Max Cap(pf)
	A0	A1	B0	Y
sky130_osu_sc_18T_ms__oai21_l	0.00513	0.00518	0.00440	0.75644

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__oai21_l	0.00000	0.02595	0.09689

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__oai21_l	A0->Y (FR)	0.10770	1.17073	11.84660
	A1->Y (FR)	0.13548	1.24016	12.27680
	B0->Y (FR)	0.06461	0.93440	9.96923

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__oai21_l	A0->Y (RF)	0.07363	0.84628	8.71816
	A1->Y (RF)	0.08635	0.84183	8.55793
	B0->Y (RF)	0.05834	0.84781	9.00773

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai21_l	A0	0.00000	0.00000	0.00000
	A0	0.00607	0.00593	0.00602
	A1	0.00000	0.00000	0.00000
	A1	0.00734	0.00725	0.00726
	B0	0.00505	0.00495	0.00510

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai21_l	A0	0.00000	0.00000	0.00000
	A0	0.00035	0.00026	0.00021
	A1	0.00000	0.00000	0.00000
	A1	0.00166	0.00146	0.00141
	B0	0.00217	0.00206	0.00202

Passive power(pJ) for A0 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00143	-0.00144	-0.00143
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	-0.00258	-0.00263	-0.00262
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	-0.00268	-0.00270	-0.00269

Passive power(pJ) for A0 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai21_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00152	0.00153	0.00146
	(A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * Y)	0.00262	0.00263	0.00262
	(!A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * Y)	0.00268	0.00273	0.00270

Passive power(pJ) for A1 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00224	-0.00257	-0.00258
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	-0.00255	-0.00262	-0.00261
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	-0.00265	-0.00266	-0.00266

Passive power(pJ) for A1 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai21_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00256	0.00259	0.00258
	(A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * Y)	0.00259	0.00262	0.00261
	(!A0 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * Y)	0.00266	0.00271	0.00267

Passive power(pJ) for B0 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai21_l	(!A0 * !A1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * Y)	-0.00220	-0.00221	-0.00227

Passive power(pJ) for B0 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai21_l	(!A0 * !A1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * Y)	0.00227	0.00232	0.00228

SKY130_OSU_SC_18T_MS__OAI22

sky130_osu_sc_18T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

INPUT				OUTPUT
A0	A1	B0	B1	Y
0	0	x	x	1
x	1	0	0	1
x	1	x	1	0
x	1	1	x	0
1	x	0	0	1
1	x	x	1	0
1	x	1	x	0

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__oai22_1	15.38460

Pin Capacitance Information

Cell Name	Pin Cap(pf)				Max Cap(pf)
	A0	A1	B0	B1	Y
sky130_osu_sc_18T_ms__oai22_1	0.00495	0.00524	0.00539	0.00527	0.77082

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__oai22_1	0.00000	0.02881	0.10725

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__oai22_l	A0->Y (FR)	0.14759	1.25834	12.38640
	A1->Y (FR)	0.12459	1.19164	11.96310
	B0->Y (FR)	0.08964	1.15091	11.93700
	B1->Y (FR)	0.11353	1.22184	12.36230

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__oai22_l	A0->Y (RF)	0.11869	0.91731	8.96873
	A1->Y (RF)	0.09684	0.88332	8.85593
	B0->Y (RF)	0.08102	0.87984	9.12148
	B1->Y (RF)	0.10476	0.92350	9.32066

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai22_l	A0	0.00946	0.00939	0.00939
	A1	0.00818	0.00804	0.00810
	B0	0.00614	0.00581	0.00612
	B1	0.00747	0.00741	0.00742

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai22_l	A0	0.00257	0.00239	0.00229
	A1	0.00133	0.00123	0.00114
	B0	0.00133	0.00122	0.00114
	B1	0.00259	0.00237	0.00231

Passive power(pJ) for A0 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00228	-0.00261	-0.00262
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	-0.00228	-0.00261	-0.00262
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	-0.00255	-0.00263	-0.00261
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	-0.00266	-0.00267	-0.00267

Passive power(pJ) for A0 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00260	0.00264	0.00262
	(A1 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * B1 * !Y)	0.00260	0.00264	0.00262
	(A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A1 * !B0 * !B1 * Y)	0.00260	0.00264	0.00261
	(!A1 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A1 * !B0 * !B1 * Y)	0.00266	0.00270	0.00268

Passive power(pJ) for A1 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai22_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	-0.00141	-0.00143	-0.00142
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	-0.00141	-0.00143	-0.00142
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	-0.00254	-0.00260	-0.00259
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	-0.00265	-0.00266	-0.00266

Passive power(pJ) for A1 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai22_l	(A0 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * B0 * !Y)	0.00151	0.00152	0.00145
	(A0 * !B0 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * B1 * !Y)	0.00151	0.00152	0.00145
	(A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(A0 * !B0 * !B1 * Y)	0.00259	0.00260	0.00259
	(!A0 * !B0 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !B0 * !B1 * Y)	0.00266	0.00271	0.00267

Passive power(pJ) for B0 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai22_l	(A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B1 * !Y)	-0.00140	-0.00142	-0.00141
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	-0.00140	-0.00142	-0.00141
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	-0.00284	-0.00290	-0.00289
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	-0.00285	-0.00288	-0.00295

Passive power(pJ) for B0 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai22_l	(A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A1 * B1 * !Y)	0.00150	0.00152	0.00144
	(A0 * !A1 * B1 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B1 * !Y)	0.00150	0.00152	0.00144
	(!A0 * !A1 * B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B1 * Y)	0.00289	0.00290	0.00289
	(!A0 * !A1 * !B1 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B1 * Y)	0.00295	0.00301	0.00296

Passive power(pJ) for B1 rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	-0.00225	-0.00257	-0.00259
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	-0.00225	-0.00257	-0.00259
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	-0.00288	-0.00296	-0.00294
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	-0.00290	-0.00293	-0.00299

Passive power(pJ) for B1 falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__oai22_l	(A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A1 * B0 * !Y)	0.00257	0.00261	0.00259
	(A0 * !A1 * B0 * !Y)	0.00000	0.00000	0.00000
	(A0 * !A1 * B0 * !Y)	0.00257	0.00259	0.00259
	(!A0 * !A1 * B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * B0 * Y)	0.00294	0.00298	0.00294
	(!A0 * !A1 * !B0 * Y)	0.00000	0.00000	0.00000
	(!A0 * !A1 * !B0 * Y)	0.00299	0.00302	0.00300

SKY130_OSU_SC_18T_MS__OR2x

sky130_osu_sc_18T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

INPUT		OUTPUT
A	B	Y
0	0	0
x	1	1
1	x	1

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__or2_1	12.45420
sky130_osu_sc_18T_ms__or2_2	15.38460
sky130_osu_sc_18T_ms__or2_4	21.24540
sky130_osu_sc_18T_ms__or2_8	32.96700
sky130_osu_sc_18T_ms__or2_l	12.45420

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_18T_ms__or2_1	0.00542	0.00521	1.60813
sky130_osu_sc_18T_ms__or2_2	0.00542	0.00521	3.15426
sky130_osu_sc_18T_ms__or2_4	0.00542	0.00521	6.12609
sky130_osu_sc_18T_ms__or2_8	0.00541	0.00522	11.55615
sky130_osu_sc_18T_ms__or2_l	0.00430	0.00405	1.10814

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__or2_1	0.00000	0.03286	0.05426
sky130_osu_sc_18T_ms__or2_2	0.00000	0.04650	0.10788
sky130_osu_sc_18T_ms__or2_4	0.00000	0.07379	0.21514
sky130_osu_sc_18T_ms__or2_8	0.00000	0.12836	0.42964
sky130_osu_sc_18T_ms__or2_l	0.00000	0.02734	0.04352

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__or2_1	A->Y (RR)	0.10562	0.90008	8.37443
	B->Y (RR)	0.09458	0.86195	8.15880
sky130_osu_sc_18T_ms__or2_2	A->Y (RR)	0.11743	0.82735	8.59741
	B->Y (RR)	0.10609	0.79856	8.42421
sky130_osu_sc_18T_ms__or2_4	A->Y (RR)	0.15518	0.82800	9.10390
	B->Y (RR)	0.14347	0.80641	8.96585
sky130_osu_sc_18T_ms__or2_8	A->Y (RR)	0.22690	0.88850	9.62921
	B->Y (RR)	0.21496	0.87194	9.52330
sky130_osu_sc_18T_ms__or2_l	A->Y (RR)	0.11819	0.99529	8.44800
	B->Y (RR)	0.10718	0.96230	8.24623

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__or2_1	A->Y (FF)	0.20164	0.96990	7.90240
	B->Y (FF)	0.17178	0.89743	7.27956
sky130_osu_sc_18T_ms__or2_2	A->Y (FF)	0.24790	0.96372	8.24031
	B->Y (FF)	0.21767	0.90116	7.64723
sky130_osu_sc_18T_ms__or2_4	A->Y (FF)	0.35634	1.05514	8.84778
	B->Y (FF)	0.32637	0.99078	8.29844
sky130_osu_sc_18T_ms__or2_8	A->Y (FF)	0.57207	1.28142	9.45817
	B->Y (FF)	0.54217	1.21261	8.98061
sky130_osu_sc_18T_ms__or2_l	A->Y (FF)	0.22441	1.03199	7.74209
	B->Y (FF)	0.19408	0.97137	7.18688

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__or2_1	A	0.00000	0.00000	0.00000
	A	0.00475	0.00423	0.00477
	B	0.00000	0.00000	0.00000
	B	0.00346	0.00298	0.00361
sky130_osu_sc_18T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.00803	0.00775	0.00799
	B	0.00000	0.00000	0.00000
	B	0.00671	0.00652	0.00703
sky130_osu_sc_18T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01508	0.01531	0.01601
	B	0.00000	0.00000	0.00000
	B	0.01375	0.01418	0.01500
sky130_osu_sc_18T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.02900	0.03004	0.03129
	B	0.00000	0.00000	0.00000
	B	0.02768	0.02917	0.03085
sky130_osu_sc_18T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00354	0.00311	0.00331
	B	0.00000	0.00000	0.00000
	B	0.00266	0.00231	0.00275

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__or2_1	A	0.00000	0.00000	0.00000
	A	0.00959	0.00956	0.00960
	B	0.00000	0.00000	0.00000
	B	0.00814	0.00813	0.00930
sky130_osu_sc_18T_ms__or2_2	A	0.00000	0.00000	0.00000
	A	0.01169	0.01215	0.01222
	B	0.00000	0.00000	0.00000
	B	0.01023	0.01069	0.01182
sky130_osu_sc_18T_ms__or2_4	A	0.00000	0.00000	0.00000
	A	0.01689	0.01833	0.01861
	B	0.00000	0.00000	0.00000
	B	0.01545	0.01671	0.01800
sky130_osu_sc_18T_ms__or2_8	A	0.00000	0.00000	0.00000
	A	0.02742	0.03009	0.03133
	B	0.00000	0.00000	0.00000
	B	0.02603	0.02847	0.03055
sky130_osu_sc_18T_ms__or2_l	A	0.00000	0.00000	0.00000
	A	0.00738	0.00728	0.00732
	B	0.00000	0.00000	0.00000
	B	0.00634	0.00631	0.00705

Passive power(pJ) for A rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__or2_1	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00230	-0.00262	-0.00263
sky130_osu_sc_18T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00230	-0.00262	-0.00263
sky130_osu_sc_18T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00230	-0.00263	-0.00263
sky130_osu_sc_18T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00230	-0.00263	-0.00264
sky130_osu_sc_18T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	-0.00168	-0.00189	-0.00189

Passive power(pJ) for A falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__or2_1	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00261	0.00264	0.00263
sky130_osu_sc_18T_ms__or2_2	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00261	0.00264	0.00263
sky130_osu_sc_18T_ms__or2_4	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00261	0.00264	0.00263
sky130_osu_sc_18T_ms__or2_8	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00261	0.00264	0.00264
sky130_osu_sc_18T_ms__or2_l	(B * Y)	0.00000	0.00000	0.00000
	(B * Y)	0.00188	0.00191	0.00189

Passive power(pJ) for B rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__or2_1	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00143	-0.00144	-0.00143
sky130_osu_sc_18T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00143	-0.00144	-0.00143
sky130_osu_sc_18T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00142	-0.00144	-0.00143
sky130_osu_sc_18T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00142	-0.00144	-0.00143
sky130_osu_sc_18T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	-0.00108	-0.00108	-0.00107

Passive power(pJ) for B falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__or2_1	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00154	0.00154	0.00146
sky130_osu_sc_18T_ms__or2_2	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00154	0.00154	0.00146
sky130_osu_sc_18T_ms__or2_4	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00154	0.00154	0.00146
sky130_osu_sc_18T_ms__or2_8	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00154	0.00154	0.00146
sky130_osu_sc_18T_ms__or2_l	(A * Y)	0.00000	0.00000	0.00000
	(A * Y)	0.00114	0.00115	0.00109

SKY130_OSU_SC_18T_MS__TBUFIx

sky130_osu_sc_18T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

INPUT		OUTPUT
A	OE	Y
-	0	HiZ
0	1	1
1	1	0

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__tbufi_1	12.45420
sky130_osu_sc_18T_ms__tbufi_l	12.45420

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_18T_ms__tbufi_1	0.00539	0.00684	0.76210
sky130_osu_sc_18T_ms__tbufi_l	0.00424	0.00539	0.52411

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__tbufi_1	0.00000	0.02719	0.10726
sky130_osu_sc_18T_ms__tbufi_l	0.00000	0.02179	0.08653

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__tbufi_1	A->Y (FR)	0.07622	1.13265	11.81020
	OE->Y (FR)	0.06659	0.38735	4.01374
	OE->Y (RR)	0.13407	1.07927	8.34561
sky130_osu_sc_18T_ms__tbufi_l	A->Y (FR)	0.09308	1.26104	11.87850
	OE->Y (FR)	0.07318	0.40098	4.01354
	OE->Y (RR)	0.15032	1.20634	8.39899

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__tbufi_1	A->Y (RF)	0.05077	0.79959	8.60070
	OE->Y (FF)	0.06807	0.38934	4.01358
	OE->Y (RF)	0.04993	0.78978	8.41646
sky130_osu_sc_18T_ms__tbufi_l	A->Y (RF)	0.05893	0.85252	8.50491
	OE->Y (FF)	0.07373	0.40231	4.01343
	OE->Y (RF)	0.05832	0.84649	8.31806

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tbufi_1	A	0.00000	0.00000	0.00000
	A	0.00424	0.00406	0.00424
	OE	0.00000	0.00000	0.00000
	OE	0.00420	0.00367	0.00454
sky130_osu_sc_18T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	0.00327	0.00320	0.00322
	OE	0.00000	0.00000	0.00000
	OE	0.00304	0.00264	0.00318

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tbufi_1	A	0.00000	0.00000	0.00000
	A	-0.00060	-0.00064	-0.00067
	OE	0.00000	0.00000	0.00000
	OE	0.00302	0.00249	0.00328
sky130_osu_sc_18T_ms__tbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00041	-0.00045	-0.00049
	OE	0.00000	0.00000	0.00000
	OE	0.00213	0.00172	0.00227

Passive power(pJ) for A rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tbufi_1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00222	-0.00225	-0.00223
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00201	-0.00203	-0.00202
sky130_osu_sc_18T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	-0.00171	-0.00173	-0.00172
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	-0.00157	-0.00158	-0.00157

Passive power(pJ) for A falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tbufi_1	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00222	0.00225	0.00223
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00209	0.00211	0.00206
sky130_osu_sc_18T_ms__tbufi_l	(!OE * Y)	0.00000	0.00000	0.00000
	(!OE * Y)	0.00171	0.00173	0.00172
	(!OE * !Y)	0.00000	0.00000	0.00000
	(!OE * !Y)	0.00162	0.00164	0.00160

Passive power(pJ) for OE rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00173	0.00122	0.00202
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00156	0.00103	0.00180
sky130_osu_sc_18T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00121	0.00081	0.00136
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00108	0.00066	0.00121

Passive power(pJ) for OE falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00492	0.00448	0.00567
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00495	0.00458	0.00575
sky130_osu_sc_18T_ms__tbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00391	0.00354	0.00429
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00395	0.00363	0.00436

SKY130_OSU_SC_18T_MS__TNBUFIx

sky130_osu_sc_18T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

INPUT		OUTPUT
A	OE	Y
0	0	1
1	0	0
-	1	HiZ

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__tnbufi_1	12.45420
sky130_osu_sc_18T_ms__tnbufi_l	12.45420

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	OE	Y
sky130_osu_sc_18T_ms__tnbufi_1	0.00539	0.00838	0.76211
sky130_osu_sc_18T_ms__tnbufi_l	0.00423	0.00636	0.52368

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__tnbufi_1	0.00000	0.04496	0.05394
sky130_osu_sc_18T_ms__tnbufi_l	0.00000	0.03617	0.04340

Delay Information

Delay(ns) to Y rising :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__tnbufi_1	A->Y (FR)	0.07728	1.13278	11.81040
	OE->Y (RR)	0.04014	0.32832	4.01480
	OE->Y (FR)	0.09567	1.19516	12.23540
sky130_osu_sc_18T_ms__tnbufi_l	A->Y (FR)	0.09414	1.26065	11.87270
	OE->Y (RR)	0.04260	0.32884	4.01504
	OE->Y (FR)	0.10894	1.30662	12.13150

Delay(ns) to Y falling :

Cell Name	Timing Arc(Dir)	Delay(ns)		
		First	Mid	Last
sky130_osu_sc_18T_ms__tnbufi_1	A->Y (RF)	0.05000	0.79892	8.60048
	OE->Y (RF)	0.03966	0.32830	4.01479
	OE->Y (FF)	0.09213	0.78154	5.79802
sky130_osu_sc_18T_ms__tnbufi_l	A->Y (RF)	0.05794	0.85169	8.50131
	OE->Y (RF)	0.04205	0.32876	4.01507
	OE->Y (FF)	0.10540	0.85143	5.72927

Power Information

Internal switching power(pJ) to Y rising :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tnbufi_1	A	0.00000	0.00000	0.00000
	A	0.00434	0.00416	0.00435
	OE	0.00000	0.00000	0.00000
	OE	0.01038	0.01024	0.01176
sky130_osu_sc_18T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	0.00338	0.00330	0.00333
	OE	0.00000	0.00000	0.00000
	OE	0.00784	0.00768	0.00866

Internal switching power(pJ) to Y falling :

Cell Name	Input	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tnbufi_1	A	0.00000	0.00000	0.00000
	A	-0.00074	-0.00077	-0.00080
	OE	0.00000	0.00000	0.00000
	OE	0.00938	0.00923	0.01062
sky130_osu_sc_18T_ms__tnbufi_l	A	0.00000	0.00000	0.00000
	A	-0.00055	-0.00058	-0.00062
	OE	0.00000	0.00000	0.00000
	OE	0.00706	0.00692	0.00776

Passive power(pJ) for A rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tnbufi_1	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00192	-0.00194	-0.00193
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00172	-0.00174	-0.00173
sky130_osu_sc_18T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	-0.00142	-0.00144	-0.00143
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	-0.00129	-0.00130	-0.00130

Passive power(pJ) for A falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tnbufi_1	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00192	0.00194	0.00193
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00179	0.00181	0.00177
sky130_osu_sc_18T_ms__tnbufi_l	(OE * Y)	0.00000	0.00000	0.00000
	(OE * Y)	0.00142	0.00144	0.00143
	(OE * !Y)	0.00000	0.00000	0.00000
	(OE * !Y)	0.00134	0.00135	0.00132

Passive power(pJ) for OE rising (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tnbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00297	-0.00381	-0.00296
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00297	-0.00375	-0.00294
sky130_osu_sc_18T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	-0.00214	-0.00273	-0.00216
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	-0.00213	-0.00271	-0.00215

Passive power(pJ) for OE falling (conditional):

Cell Name	When	Power(pJ)		
		first	mid	last
sky130_osu_sc_18T_ms__tnbufi_1	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00790	0.00777	0.00919
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00777	0.00760	0.00904
sky130_osu_sc_18T_ms__tnbufi_l	(A * !Y)	0.00000	0.00000	0.00000
	(A * !Y)	0.00601	0.00587	0.00676
	(!A * Y)	0.00000	0.00000	0.00000
	(!A * Y)	0.00590	0.00576	0.00664

SKY130_OSU_SC_18T_MS__XNOR2

sky130_osu_sc_18T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

INPUT		OUTPUT
A	B	Y
0	0	1
0	1	0
1	0	0
1	1	1

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__xnor2_1	21.24540

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_18T_ms__xnor2_1	0.01064	0.00966	0.77981

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__xnor2_1	0.00000	0.09190	0.16120

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_18T_ms__xnor2_l	A->Y (RR)	B	0.17141	1.14307	8.66754
	A->Y (FR)	!B	0.10090	1.16808	11.96570
	B->Y (RR)	A	0.13756	1.10396	8.55926
	B->Y (FR)	!A	0.13152	1.23754	12.39160

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_18T_ms__xnor2_l	A->Y (FF)	B	0.15337	0.90475	6.43574
	A->Y (RF)	!B	0.07505	0.82981	8.66531
	B->Y (FF)	A	0.13786	0.88684	6.42201
	B->Y (RF)	!A	0.08856	0.84832	8.67974

Power Information

Internal switching power(pJ) to Y rising (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_18T_ms__xnor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00411	0.00350	0.00414
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01042	0.00995	0.01142
	B	A	0.00000	0.00000	0.00000
	B	A	0.00171	0.00124	0.00197
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01129	0.01097	0.01234

Internal switching power(pJ) to Y falling (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_18T_ms__xnor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.01303	0.01246	0.01346
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00302	0.00240	0.00308
	B	A	0.00000	0.00000	0.00000
	B	A	0.01168	0.01155	0.01275
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00407	0.00337	0.00400

SKY130_OSU_SC_18T_MS__XOR2

sky130_osu_sc_18T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

INPUT		OUTPUT
A	B	Y
0	0	0
0	1	1
1	0	1
1	1	0

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__xor2_l	21.24540

Pin Capacitance Information

Cell Name	Pin Cap(pf)		Max Cap(pf)
	A	B	Y
sky130_osu_sc_18T_ms__xor2_l	0.01064	0.00971	0.76189

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__xor2_l	0.00000	0.09190	0.15064

Delay Information

Delay(ns) to Y rising (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_18T_ms__xor2_l	A->Y (RR)	!B	0.16409	1.11698	8.44819
	A->Y (FR)	B	0.12062	1.21726	12.27090
	B->Y (RR)	!A	0.14098	1.10003	8.44223
	B->Y (FR)	A	0.13015	1.22999	12.26980

Delay(ns) to Y falling (conditional):

Cell Name	Timing Arc(Dir)	When	Delay(ns)		
			First	Mid	Last
sky130_osu_sc_18T_ms__xor2_l	A->Y (FF)	!B	0.14147	0.87652	6.22711
	A->Y (RF)	B	0.07028	0.82749	8.62375
	B->Y (FF)	!A	0.13150	0.86393	6.18705
	B->Y (RF)	A	0.08173	0.82561	8.44370

Power Information

Internal switching power(pJ) to Y rising (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_18T_ms__xor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.01203	0.01173	0.01310
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.00239	0.00141	0.00201
	B	A	0.00000	0.00000	0.00000
	B	A	0.01234	0.01206	0.01344
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.00152	0.00101	0.00174

Internal switching power(pJ) to Y falling (conditional):

Cell Name	Input	When	Power(pJ)		
			first	mid	last
sky130_osu_sc_18T_ms__xor2_l	A	B	0.00000	0.00000	0.00000
	A	B	0.00287	0.00208	0.00268
	A	!B	0.00000	0.00000	0.00000
	A	!B	0.01316	0.01293	0.01415
	B	A	0.00000	0.00000	0.00000
	B	A	0.00288	0.00214	0.00278
	B	!A	0.00000	0.00000	0.00000
	B	!A	0.01189	0.01182	0.01304

SKY130_OSU_SC_18T_MS_x

sky130_osu_sc_18T_ms_tt_1P35_25C.ccs
Cell Library: Process , Voltage 1.35,
Temp 25.00

Truth Table

INPUT
A
x

Footprint

Cell Name	Area
sky130_osu_sc_18T_ms__ant	6.59340
sky130_osu_sc_18T_ms__tiehi	6.59340
sky130_osu_sc_18T_ms__tielo	6.59340

Pin Capacitance Information

Cell Name	Pin Cap(pf)
	A
sky130_osu_sc_18T_ms__ant	0.36201
sky130_osu_sc_18T_ms__tiehi	0.00000
sky130_osu_sc_18T_ms__tielo	0.00000

Leakage Information

Cell Name	Leakage(nW)		
	Min.	Avg	Max.
sky130_osu_sc_18T_ms__ant	0.00000	123909.00000	247819.00000
sky130_osu_sc_18T_ms__tiehi	0.00000	0.00000	0.00000
sky130_osu_sc_18T_ms__tielo	0.00000	0.00000	0.00000

Passive Power Information

Passive power(pJ) for A rising :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_18T_ms__ant	0.00000	0.00000	0.00000
	-0.00202	0.02668	0.33707

Passive power(pJ) for A falling :

Cell Name	Power(pJ)		
	first	mid	last
sky130_osu_sc_18T_ms__ant	0.00000	0.00000	0.00000
	2.15646	2.02193	0.43424